COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331

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GAIL FARBER, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

May 20, 2014

The Honorable Board of Supervisors
County of Los Angeles
383 Kenneth Hahn Hall of Administration
500 West Temple Street
Los Angeles, California 90012

ADOPTED
BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES

38 May 20, 2014

SACHI A. HAMAI
EXECUTIVE OFFICER

Dear Supervisors:

**DELEGATE AUTHORITY FOR
THE COUNTY OF LOS ANGELES AND
THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT TO
ENTER INTO A MEMORANDUM OF UNDERSTANDING
FOR DEVELOPMENT AND IMPLEMENTATION OF A
COORDINATED COMPLIANCE MONITORING AND REPORTING PLAN FOR THE GREATER
LOS ANGELES AND LONG BEACH HARBOR WATERS
(SUPERVISORIAL DISTRICTS 2 AND 4)
(3 VOTES)**

SUBJECT

This action is to authorize the Director of Public Works and Chief Engineer of the Los Angeles County Flood Control District or her designee to execute, on behalf of the County of Los Angeles and the Los Angeles County Flood Control District, respectively, a Memorandum of Understanding including subsequent amendments, for the preparation of a Coordinated Compliance, Monitoring, and Reporting Plan for the Greater Los Angeles and Long Beach Harbor Waters and the implementation of that plan for a duration of five years to comply with the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit.

IT IS RECOMMENDED THAT THE BOARD:

1. Find that the proposed Memorandum of Understanding for the preparation and implementation of a Coordinated Compliance, Monitoring, and Reporting Plan for the Greater Los Angeles and Long Beach Harbor Waters is exempt from the California Environmental Quality Act for the reasons stated in this letter and in the record of the project.

2. Authorize the Director of Public Works or her designee to execute, on behalf of the County of Los

Angeles, a Memorandum of Understanding substantially similar to the enclosed Memorandum of Understanding for an estimated not to exceed cost to the County of Los Angeles of $15,000 annually for a duration of five fiscal years (until June 30, 2018).

3. Authorize the Director of Public Works or her designee to execute any necessary amendments to this Memorandum of Understanding, provided that any amendments that relate to costs are budgeted and do not increase the County of Los Angeles' annual cost by more than 10 percent.

IT IS ALSO RECOMMENDED THAT THE BOARD ACTING AS THE GOVERNING BODY OF THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT:

1. Find that the proposed Memorandum of Understanding for the preparation and implementation of a Coordinated Compliance, Monitoring, and Reporting Plan for the Greater Los Angeles and Long Beach Harbor Waters is exempt from the California Environmental Quality Act for the reasons stated in this letter and in the record of the project.

2. Authorize the Chief Engineer of the Los Angeles County Flood Control District or her designee to execute, on behalf of the Los Angeles County Flood Control District, a Memorandum of Understanding substantially similar to the enclosed Memorandum of Understanding for an estimated not to exceed cost to the Los Angeles County Flood Control District of $60,000 annually for a duration of five fiscal years (until June 30, 2018).

3. Authorize the Chief Engineer of the Los Angeles County Flood Control District or her designee to execute, any necessary amendments to this Memorandum of Understanding, provided that any amendments that relate to costs are budgeted and do not increase the Los Angeles County Flood Control District's annual cost by more than 10 percent.

PURPOSE/JUSTIFICATION OF RECOMMENDED ACTION

The purpose of the recommended action is to find the proposed Memorandum of Understanding (MOU), in a form substantially similar to the enclosed, exempt from the California Environmental Quality Act (CEQA) and to authorize the Director of Public Works or her designee and the Chief Engineer of the Los Angeles County Flood Control District (LACFCD) or her designee to execute the MOU with the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority (GWMA) to contribute to the preparation of a Coordinated Compliance, Monitoring, and Reporting Plan (CCMRP) for the Greater Los Angeles and Long Beach Harbor Waters, and to contribute to the implementation of that plan, for a duration of five fiscal years (until June 30, 2018). Participating in the development and implementation of the CCMRP is part of the County of Los Angeles (County) and the LACFCD's ongoing program to comply with the requirements of the National Pollutant Discharge Elimination System Municipal Separate Storm Sewer System Permit (MS4 Permit). The MOU will establish the conditions under which the County, LACFCD, and other responsible Permittees will collaborate in the development and implementation of the CCMRP. Under the MOU, the GWMA will act as the contract administrator and retain consultant support to implement the CCMRP.

Implementation of Strategic Plan Goals

The Countywide Strategic Plan directs the provision of Operational Effectiveness (Goal 1). The recommended action supports the development of a cooperative partnership with local agencies to provide a public service in an effective and efficient manner.

FISCAL IMPACT/FINANCING

Each of the participating Permittees' fair share of the cost to develop and implement this program has been agreed upon and is reflected in the MOU. The costs include the development of the CCMRP, monitoring, contract management, and a yearly increase to address inflation. Costs are distributed based on the land and water area over which each Permittee has jurisdiction or responsibility.

As shown on Exhibit A of the enclosed MOU, the net County cost for Fiscal Years 2013-14 through 2017-18 is estimated not-to-exceed $15,000 annually and will not exceed $75,000 over the 5-year period. The net County cost for the first 2 years of this MOU is included in the Fiscal Year 2013-14 and proposed 2014-15 Unincorporated Area Stormwater Budget, which is part of the Department of Public Works' General Fund Budget. The net LACFCD cost for Fiscal Years 2013-14 through 2017-18 is estimated not-to-exceed $60,000 annually and will not exceed $300,000 over the 5-year period. The net LACFCD cost for the first 2 years of this MOU is included in Flood Fund Fiscal Year 2013-14 and Fiscal Year 2014-15 Budget. Funding for costs under the MOU for subsequent fiscal years will be requested through the annual budget process.

The GWMA on behalf of the Permittees will collect the funds required to develop and implement the CCMRP. The Permittees have agreed to distribute the total cost equally over the five years needed to develop and implement the CCMRP, namely Fiscal Years 2013-14 thru 2017-18.

FACTS AND PROVISIONS/LEGAL REQUIREMENTS

On March 23, 2012, the U.S. Environmental Protection Agency established the Total Maximum Daily Load for Toxic Pollutants in Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters (Dominguez Channel Toxics TMDL) with the intent of protecting and improving water quality in the Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters. On December 28, 2012, the new MS4 Permit became effective. The new MS4 Permit encourages Permittees (including the County and LACFCD) to collaborate with one another in the development of planning strategies and projects to improve water quality in the County of Los Angeles. The Dominguez Channel Toxics TMDL and its requirements have been incorporated into the new MS4 Permit. In June 2013, Permittees responsible for the Greater Los Angeles and Long Beach portion of the Dominguez Channel Toxics TMDL submitted the CCMRP to the California Regional Water Quality Control Board.

To continue these collaborative efforts to comply with the MS4 Permit, the County and LACFCD will need to enter into a MOU with the other Permittees listed in the Dominguez Channel Toxics TMDL. The County's total cost-share for the MOU, including subsequent amendments, will not exceed $15,000 annually ($75,000 over 5 years). The LACFCD's total cost-share for the MOU, including subsequent amendments, will not exceed $60,000 annually ($300,000 over 5 years). This MOU will establish the conditions under which the County and other participating Permittees in the MOU will collaborate in the development and implementation of the CCMRP. Examples of potential amendments to the initial MOUs include, but are not limited to, the following: changes to the number of Permittees participating in the CCMRP and changes to the Scope of Work due to field constraints or clarifications of the MS4 Permit requirements by the California Regional Water Quality Control Board.

Participating in the development and implementation of the CCMRP is part of the County and LACFCD's ongoing program to comply with the requirements of the MS4 Permit.

The enclosed MOU has been approved as to form by County Counsel. Upon the Board's delegation of authority, the agreement will be executed by the Director of Public Works and Chief Engineer or her designee on behalf of the County and LACFCD, respectively, with the GWMA and the 10 other Permittees.

ENVIRONMENTAL DOCUMENTATION

The proposed activities are statutorily exempt from CEQA. The proposed MOU, which includes funding for the development and implementation of the CCMRP, involves feasibility and planning studies for possible future actions, which have not been approved, adopted, or funded and, therefore, are exempt under Section 15262 of the CEQA Guidelines. Further, the proposed activities do not include the adoption of a plan that will have a legally binding effect on later activities. Public Works and the LACFCD will return to the Board with the appropriate environmental documentation for approval of any projects recommended as a result of the CCMRP process.

Upon the Board's approval of the recommended actions, Public Works and the LACFCD will file a Notice of Exemption with the County Clerk in accordance with Section 15062 of the CEQA Guidelines.

IMPACT ON CURRENT SERVICES (OR PROJECTS)

There will be no negative impact on current services.

CONCLUSION

Please return one adopted copy of this letter to the Chief Executive Office (Community and Municipal Services Cluster) and one copy to the Department of Public Works, Watershed Management Division.

Respectfully submitted,

Gail Farber

GAIL FARBER
Director

GF:GH:ba

Enclosures

c: Chief Executive Office (Rita Robinson)
County Counsel
Executive Office

MEMORANDUM OF UNDERSTANDING BETWEEN THE LOS ANGELES GATEWAY REGION INTEGRATED REGIONAL WATER MANAGEMENT JOINT POWERS AUTHORITY AND THE CITIES OF BELLFLOWER, LAKEWOOD, LONG BEACH, PARAMOUNT, RANCHO PALOS VERDES, ROLLING HILLS, ROLLING HILLS ESTATES, SIGNAL HILL, AND LOS ANGELES, ACTING BY AND THROUGH ITS BOARD OF HARBOR COMMISSIONERS, THE COUNTY OF LOS ANGELES, LOS ANGELES COUNTY FLOOD CONTROL DISTRICT, AND THE PORT OF LONG BEACH

FOR ADMINISTRATION AND COST SHARING FOR THE PREPARATION AND IMPLEMENTATION OF A COORDINATED COMPLIANCE MONITORING AND REPORTING PLAN AS REQUIRED BY THE REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION FOR THE DOMINGUEZ CHANNEL AND LOS ANGELES AND LONG BEACH HARBORS WATERS TOXIC POLLUTANTS TOTAL MAXIMUM DAILY LOADS

This Memorandum of Understanding ("MOU") is made and entered into as of May 1, 2014, by and between the Los Angeles Gateway Region Integrated Regional Water Management Joint Powers Authority ("GWMA"), a California Joint Powers Authority, and the Cities of Bellflower, Lakewood, Long Beach, Paramount, Rancho Palos Verdes, Rolling Hills, Rolling Hills Estates, Signal Hill, and Los Angeles, acting by and through its Board of Harbor Commissioners ("POLA"), the County of Los Angeles, the Los Angeles County Flood Control District ("LACFCD"), and separately the City of Long Beach Harbor Department, acting by and through its Board of Harbor Commissioners ("Port of Long Beach").

RECITALS

WHEREAS, the mission of the GWMA includes the equitable protection and management of water resources within its area; and

WHEREAS, for the purposes of this MOU, the term "Permittees" shall mean the Cities of Bellflower, Lakewood, Long Beach, Paramount, Rancho Palos Verdes, Rolling Hills, Rolling Hills Estates, and Signal Hill, and the County of Los Angeles, the LACFCD, POLA, and the Port of Long Beach; and

WHEREAS, the United States Environmental Protection Agency established the Total Maximum Daily Loads ("TMDL") for Toxic Pollutants on March 23, 2012, with the intent of protecting and improving water quality in the Dominguez Channel and the Greater Los Angeles and Long Beach Harbor Waters ("Harbor Toxic Pollutants TMDL"); and

WHEREAS, the Harbor Toxic Pollutants TMDL regulates certain discharges from National Pollutant Discharge Elimination System ("NPDES") permit holders, requiring organization and cooperation among the Permittees; and

WHEREAS, the Permittees manage, drain or convey storm water into at least a portion of the Dominguez Channel, Greater Los Angeles and Long Beach Harbor Waters (including Consolidated Slip) and the Los Angeles River Estuary ("Greater Harbor Waters"); and

WHEREAS, several of these Permittees are in multiple watersheds and this MOU shall only pertain to those areas tributary to the Greater Harbor Waters; and

WHEREAS, the Permittees desire to facilitate the achievement of the objectives of the Harbor Toxic Pollutants TMDL by preparation and implementation of a Coordinated Compliance Monitoring and Reporting Plan ("CCMRP") to ensure consistency with other regional monitoring programs and usability with other TMDL related studies; and

WHEREAS, POLA and the Port of Long Beach, on behalf of the Permittees, have retained a consultant, Anchor QEA, L.L.C. ("Consultant"), and have prepared and submitted the CCMRP to the Los Angeles Regional Water Quality Control Board ("Regional Board"); and

WHEREAS, implementation of the CCMRP requires administrative and professional coordination services for the Permittees that the GWMA can provide; and

WHEREAS, the Permittees have collaborated to assist the GWMA in the implementation of the CCMRP; and

WHEREAS, the Permittees have determined that the costs of preparing and implementing the CCMRP and other related costs incurred by the GWMA in administering this MOU should be shared by the Permittees; and

WHEREAS, POLA and the Port of Long Beach have already paid the Consultant to prepare the CCMRP and the Permittees desire to reimburse POLA and the Port of Long Beach for the Permittees' share of the costs to prepare the CCMRP; and

WHEREAS, each Permittee shall pay its share of the costs of preparing and implementing the CCMRP, and any administrative costs related thereto ("Respective Costs") based on the Cost Sharing Tables contained in **Exhibit "A"**; and

WHEREAS, on behalf of the Permittees, the GWMA shall administer and enter into a contract for monitoring and implementing the CCMRP with the Consultant; and

WHEREAS, the Permittees and the GWMA are collectively referred to as the ("Parties"); and

WHEREAS, the State of California, through its Department of Transportation ("Caltrans") is considering participating in the cost-sharing for the preparation and implementation of the CCMRP; and

WHEREAS, because it is unknown to the Parties and Caltrans when Caltrans will obtain approval to fund Caltrans's portion of the cost-sharing of the preparation and implementation of the CCMRP, the Parties authorize the GWMA to enter into a separate agreement with Caltrans for CCMRP cost sharing purposes only; and

WHEREAS, individual NPDES permit holders that are not Permittees may wish to participate in the CCMRP for individual permit compliance; and

WHEREAS, the Parties contemplate allowing other individual NPDES permit holders to participate in the CCMRP without being a party to this MOU, in order to minimize the costs of preparing and implementing the CCMRP to each of the Permittees; and

WHEREAS, the Parties authorize the GWMA to enter into individual separate agreements with such individual NPDES permit holders (which shall not become parties to this MOU) for CCMRP cost sharing purposes only; and

WHEREAS, if Caltrans or other individual NPDES permit holders participate in the cost sharing relating to the CCMRP, the Parties contemplate that the Cost Sharing Table in **Exhibit "A"** will be modified as appropriate and each Permittee's proportional payment obligation reduced accordingly to reflect Caltrans's and/or other individual NPDES permit holders' payments; and

WHEREAS, the Permittees have elected to implement the CCMRP to address the Harbor Toxic Pollutants TMDL requirements; and

WHEREAS, the Permittees have approved the Consultant's Scope of Work set forth in **Exhibit "B"**; and

WHEREAS, the Consultant shall conduct monitoring to implement the CCMRP and any other plans, as set forth in the Scope of Work in **Exhibit "B"**, or any amendments thereto that the Permittees have approved in advance; and

WHEREAS, the Parties have determined that authorizing the GWMA to retain the Consultant to conduct monitoring necessary to implement the CCMRP will be beneficial to the Permittees; and

WHEREAS, the role of the GWMA is to: (a) invoice and collect funds from each of the Permittees to cover the costs of preparing and implementing the CCMRP and paying the Consultant; (b) facilitate the reimbursement of the Permittees' share of the costs to prepare the CCMRP to POLA and the Port of Long Beach; (c) administer the Consultant's contract for implementation of the CCMRP; and (d) at the request of the Permittees, negotiate, enter into agreements with, and collect funds from Caltrans and individual NPDES permit holders for cost-sharing in the preparation and implementation of the CCMRP.

NOW, THEREFORE, in consideration of the mutual covenants and conditions set forth herein, the Parties do hereby agree as follows:

Section 1. Recitals. The recitals set forth above are fully incorporated as part of this MOU.

Section 2. Purpose. The purpose of this MOU is to reimburse the Port of Long Beach and POLA for their proportional share of the costs of preparing the CCMRP based on the Cost Sharing Tables in **Exhibit "A"**, to cost share in the implementation of the CCMRP, and to compensate the GWMA for costs associated with its role and duties under this MOU.

Section 3. Cooperation. The Parties shall fully cooperate with one another to achieve the purposes of this MOU.

Section 4. Voluntary Nature. The Parties voluntarily enter into this MOU.

Section 5. Binding Effect. This MOU shall become binding on GWMA and the Permittees that execute this MOU.

Section 6. Term. This MOU shall remain and continue in effect for five (5) years following the execution of this MOU, unless terminated earlier pursuant to this MOU.

Section 7. Permittee Representative.

(a) Each Permittee shall appoint a representative ("Representative") and, as necessary, an "Alternate Representative" to attend meetings of the Permittees. Each Permittee shall have one vote on decisions to be made by the Permittees. Except as noted below, all decisions to be made by Permittees shall require a majority vote.

(b) The Permittees shall appoint a Chair ("Chair"), who shall have the authority to speak on behalf of the Permittees to the GWMA on decisions to be made by the Permittees. The Permittees may also appoint a Vice-Chair ("Vice-Chair"), who shall have the authority to speak on behalf of the Permittees in the event the Chair is unavailable. The Permittees shall inform the GWMA of the names of the Chair and Vice-Chair in writing. The GWMA may rely on written directions from the Chair, or the Vice-Chair, if the Chair is unavailable. In the event of conflicting directions from the Chair and the Vice-Chair, the GWMA shall rely on the Chair's direction.

(c) The Chair shall be the means of communication between the Permittees and the GWMA on the approval of: (i) the Consultant's scope of work and any amendments thereto; (ii) the payment of the Consultant's invoices; (iii) the payment of any other costs as the Permittees deem necessary; (iv) budget increases; or (v) the participation of Caltrans or individual NPDES permit holders in the cost-sharing relating to the CCMRP.

Section 8. Role of the GWMA.

(a) The GWMA shall invoice and collect funds from each of the Permittees to cover the costs of preparing and implementing the CCMRP and paying the Consultant, according to the Cost Sharing Tables in **Exhibit "A"**;

(b) The GWMA shall facilitate the reimbursement of the Permittees' share of the costs to prepare the CCMRP to POLA and the Port of Long Beach; and

(c) The GWMA shall administer the Consultant's contract for implementation of the CCMRP by contracting with and paying the Consultant as approved by the Permittees; and

(d) At the request of the Permittees, the GWMA is authorized and shall negotiate, enter into agreements with, and collect funds from Caltrans and individual NPDES permit holders that are not Permittees for cost-sharing in the preparation and implementation of the CCMRP.

Section 9. Financial Terms.

(a) Each Permittee shall pay its proportional share of costs ("Respective Costs") based on the Cost Sharing Table contained in **Exhibit "A"**; for Consultant and any other related costs which the Chair informs the GWMA in writing that the Permittees have approved, provided, however, that the LACFCD's total costs shall not exceed ten percent (10%) of the sum total of all Respective Costs without the LACFCD's written agreement. In the event the Permittees approve an increase in the budget that would cause the LACFCD's Respective Costs to exceed ten percent (10%) of the total Respective Costs, the GWMA shall terminate this MOU if the LACFCD does not inform the GWMA in writing within thirty (30) days that it will pay its increased Respective Costs unless the Permittees, through their Chair, inform the GWMA within that time that the other Permittees agree to absorb the LACFCD's additional Respective Costs.

(b) In addition to the Respective Costs, each Permittee shall also pay its proportional share of the GWMA's staff time for hiring the Consultant and invoicing the Permittees, audit expenses and other overhead costs, including reasonable legal fees incurred by the GWMA in the performance of its duties under this MOU ("MOU Costs"). The GWMA shall add three percent (3%) to each invoice submitted to each Permittee to cover each Permittee's share of the MOU Costs.

(c) The GWMA shall submit the first invoice for the 2013-2014 fiscal year to each Permittee reflecting each Permittee's estimated Respective Costs and MOU Costs, as provided in **Table 2 of Exhibit "A"** no later than June 30, 2014. For each successive year commencing with the 2014-2015 fiscal year, the GWMA shall submit invoices to the Permittees per the Cost Share Table in **Table 2 of Exhibit "A"** no later than April 15th annually. The GWMA shall not make any payment to the Consultant without the approval of the Permittees as expressed in writing by the Chair.

(d) The GWMA shall not be required to incur obligations for any fiscal year in excess of the costs reflected in **Exhibit "A"** or in excess of any budget approved by the GWMA and the Permittees unless the Permittees authorize the GWMA to expend the additional funds. The GWMA may suspend the work of the Consultant as necessary to avoid incurring additional financial obligation

(e) Upon receiving an invoice from the GWMA, each Permittee shall pay their invoices to the GWMA within sixty (60) days of the invoice's date.

(f) The costs for the 2013-2014 fiscal year shall be as provided in **Table 2 of Exhibit "A."** For each successive year commencing with the 2014-2015 fiscal year, any increase above the recommended costs listed in **Table 2 of Exhibit "A"** will require an amendment to this MOU. The GWMA shall not expend funds nor incur obligations in excess of the projected costs without prior notification to and approval by the Permittees.

(g) A Permittee will be delinquent if its invoiced payment is not received by the GWMA within sixty (60) days after the invoice's date. The GWMA will follow the procedure listed below, or such other procedure that the Permittees direct to effectuate payment: 1) verbally contact the representative of the Permittee; and 2) submit a formal letter from the GWMA Executive Officer to the Permittee at the address listed in Section 13 of the MOU. If payment is not received within ninety (90) days of the invoice date, the GWMA may terminate this MOU unless the City Managers/Administrators/Chief Executive Officers for those non-delinquent Permittees inform the GWMA in writing that they agree to adjust their Respective Cost allocations in accordance with the Cost Sharing Tables in **Exhibit "A"** to account for the delinquent Permittees costs. However, no such termination may be ordered unless the GWMA first provides the Permittees with sixty (60) days written notice of its intent to terminate the MOU. If the GWMA receives such confirmation from the City Managers/Administrators/Chief Executive Officers, the delinquent Permittee's participation in this MOU will be terminated and the Cost Sharing Tables in **Exhibit "A"** or such other formula to which the Permittees shall direct will be adjusted. A terminated Permittee shall remain obligated to GWMA for its delinquent payments and any other obligations incurred prior to the date of termination.

(h) The GWMA may suspend or modify the scope of work being performed by any Consultant retained by GWMA whenever any Permittee has not paid its invoice within ninety (90) days of the invoice date unless the City Managers/Administrators/Chief Executive Officers of those non-delinquent Permittees inform the GWMA that they will pay the delinquent Permittee's costs once the MOU with the delinquent Permittee has been terminated.

(i) Any delinquent payments by a Permittee shall accrue compound interest at the average rate of interest paid by the Local Agency Investment Fund during the time that the payment is delinquent.

(j) Funds remaining in the possession of the GWMA at the end of the term of this MOU, or at the termination of this MOU, whichever occurs earlier, shall be promptly returned to the then-remaining non-delinquent Permittees and in accordance with the Cost Sharing Table in **Exhibit "A"**.

Section 10. Independent Contractor.

(a) The GWMA is, and shall at all times remain, a wholly independent contractor for performance of the obligations described in this MOU. The GWMA's officers, officials, employees and agents shall at all times during the Term of this MOU be under the exclusive control of the GWMA. The Permittees cannot control the conduct of the GWMA or any of its officers, officials, employees or agents. The GWMA and its officers, officials, employees, and agents shall not be deemed to be employees of the Permittees.

(b) The GWMA is solely responsible for the payment of salaries, wages, other compensation, employment taxes, workers' compensation, or similar taxes for its employees and consultants performing services hereunder.

Section 11. Indemnification and Insurance.

(a) The GWMA shall include in the agreements with the Consultant an indemnification clause requiring the Consultant to defend, indemnify and hold harmless each of the Permittees and the GWMA, their officers, employees, and agents, from and against any and all liabilities, actions, suits, proceedings, claims, demands, losses, costs, and expenses, including legal costs and attorney's fees, for injury to or death of person(s), for damage to property (including property owned by the GWMA or any Permittee) resulting from negligent or intentional acts, errors and omissions committed by Consultant, their officers, employees, and other representatives and agents, arising out of or related to Consultant's performance under its agreement with the GWMA.

(b) Each Permittee shall defend, indemnify and hold harmless the other Parties and their officers, employees, and other representatives and agents from and against any and all liabilities, actions, suits proceedings, claims, demands, losses, costs, and expenses, including legal costs and attorney's fees, for injury to or death of person(s), for damage to property (including property owned by the GWMA and any Permittee) for negligent or intentional acts, errors and omissions committed by the indemnifying Permittee or its officers, employees, and agents, arising out of or related to that Permittee's performance under this MOU, except for such loss as may be caused by GWMA's or any other Party's negligence or that of its officers, employees, or other representatives and agents other than the Consultant.

(c) The GWMA shall defend, indemnify and hold harmless the Permittees, their officers, employees, and other representatives and agents of the Permittees, from and against any and all liabilities, actions, suits proceedings, claims, demands, losses, costs, and expenses, including legal costs and attorney's fees, for injury to or death of person(s), for damage to property (including property owned by the

Permittees) and for negligent or intentional acts, errors and omissions committed by GWMA, its officers, employees, and agents, arising out of or related to GWMA's performance under this MOU.

(d) Consultant's Insurance. The GWMA shall require the Consultant to obtain and maintain through the term of their contracts with the GWMA the following policies of insurance with minimum limits as indicated below and issued by insurers with A.M. Best ratings of no less than A:

i. Comprehensive Commercial General Liability Insurance with minimum limits of One Million Dollars ($1,000,000) per incident or accident for bodily injury, death and property damage;

ii. Automobile Liability Insurance for any owned, non-owned or hired vehicle used in connection with the performance of the Services under this MOU with minimum combined single limits coverage of One Million Dollars ($1,000,000);

iii. Professional Liability (Errors and Omissions) Insurance, which in aggregate with the Comprehensive General Liability Insurance, provides a minimum limit of Two Million Dollars ($2,000,000) per incident; and

iv. Workers' Compensation insurance as required by the State of California.

(e) GWMA makes no guarantee or warranty that the reports prepared by GWMA and its Consultant shall be approved by the relevant governmental authorities. GWMA shall have no liability to the Permittees for the negligent or intentional acts or omissions of GWMA's Consultant. The Permittees' sole recourse for any negligent or intentional act or omission of the GWMA's Consultant shall be against the Consultant and its insurance.

Section 12. Termination.

(a) A Permittee may withdraw from this MOU for any reason, or no reason, by giving the other Parties prior written notice thereof. The withdrawing Permittee shall be responsible for its Respective Costs and MOU Costs through the end of the current fiscal year during which said Permittee withdraws. Moreover, unless the withdrawing Permittee provides written notice of withdrawal to the other Parties by the March 1st immediately prior to the new fiscal year, the withdrawing Permittee shall also be responsible for its Respective Costs and MOU Costs through the end of the new fiscal year (*e.g.*, If a permittee withdraws on March 2, 2015, said permittee is responsible for its share of costs for both FY 2015-2016 and FY 2014-2015. If the same permittee withdraws on February 25, 2015, said permittee is responsible for costs only for FY 2014-2015, not for FY 2015-2016). Such Respective Costs and MOU Costs shall include the remaining fees of any Consultant retained by the GWMA through the end of the new fiscal year. Should any Permittee withdraw from the MOU, the remaining Permittees' Respective Cost allocation shall be adjusted in accordance with

the Cost Sharing Table in **Table 2 of Exhibit "A"**. A withdrawing Permittee shall remain liable for any loss, debt, or liability otherwise incurred through the end of the new fiscal year.

(b) The GWMA may, with a two-thirds (2/3) vote of the full GWMA Policy Board, terminate this MOU upon not less than thirty (30) days written notice to the Parties. Any remaining funds not due and payable or otherwise legally committed to Consultant shall be returned to the remaining Permittees in accordance with the Cost Sharing Table set forth in **Table 2 of Exhibit "A"**.

Section 13. Miscellaneous.

(a) Other NPDES Permit Holders.

i. Individual or general NPDES permit holders who are not Permittees that receive Harbor Toxic Pollutants TMDL monitoring requirements in their NPDES permits may wish to participate in the implementation of the CCMRP in order to utilize the CCMRP monitoring data to satisfy all or part of the monitoring and reporting requirements in their NPDES permits. Any such NPDES permit holder may submit a letter of interest to the Chair requesting to become a participant in the CCMRP. The letter of interest at a minimum shall contain a commitment to pay annually twelve thousand three hundred dollars ($12,300) ("Annual Payment Amount") for participant status.

ii. Upon receipt of the letter of interest, the Chair shall distribute the letter to the Permittees who shall vote on whether to grant the NPDES permit holder participant status. If the Permittees by majority vote determine that participant status should be granted, the Chair shall notify GWMA and shall send a letter of acceptance to the NPDES permit holder stating the date by which its first Annual Payment Amount must be made. Failure to pay the Annual Payment Amount by the date set forth in the letter of acceptance shall result in termination of the NPDES permit holder's participant status.

iii. An NPDES permit holder accepted as a participant shall not be a Permittee or one of the Parties to this MOU and shall not be entitled to appoint a representative or to vote or participate in any way in decisions assigned to Permittees by this MOU. Participant status entitles an NPDES permit holder only to the monitoring data collected as part of the CCMRP and to have its name included on all reports submitted in accordance with the CCMRP for any fiscal year in which the participant has paid its Annual Payment Amount.

(b) Notices. All Notices which the Parties require or desire to give hereunder shall be in writing and shall be deemed given when delivered personally or three (3) days after mailing by registered or certified mail (return receipt requested) to the following address or as such other addresses as the Parties may from time to time designate by written notice in the aforesaid manner:

To GWMA:

Ms. Grace Kast
GWMA Executive Officer
c/o Gateway Cities Council of Governments
16401 Paramount Boulevard
Paramount, CA 90723

To the Permittees:

Mr. Jeffrey L. Stewart
City Manager
City of Bellflower
16600 Civic Center Drive
Bellflower, CA 90706

Ms. Lisa A. Rapp,
Director of Public Works
City of Lakewood
5050 Clark Avenue
Lakewood, CA 90712

Mr. Anthony Arevalo
Storm Water/Environmental Compliance
Storm Water Management Division
City of Long Beach
333 West Ocean Boulevard, 9th Floor
Long Beach, CA 90802

Mr. A.J. Moro
Acting Executive Director
Port of Long Beach
925 Harbor Plaza
Long Beach, CA 90802

Mr. Chris Cannon
Director of Environmental Management
Port of Los Angeles on behalf of the City of Los Angeles
425 S. Palos Verdes Street
San Pedro, CA 90713

Mr. Christopher S. Cash
Director of Public Works
City of Paramount
16400 Paramount Blvd.
Paramount, CA 90723

Ms. Carolynn Petru
Acting City Manager
Rancho Palos Verdes
30940 Hawthorne Blvd
Rancho Palos Verdes, CA 90275

Mr. Raymond R. Cruz
City Manager
City of Rolling Hills
2 Portuguese Road
Rolling Hills, CA 90274

Mr. Greg Grammer
Assistant City Manager
City of Rolling Hills Estates
4045 Palos Verdes Drive North
Rolling Hills Estates, CA 90274

Mr. Kenneth C. Farfsing
City Manager
City of Signal Hill
2175 Cherry Avenue
Signal Hill, CA 90755

Ms. Gail Farber
Director of Public Works
County of Los Angeles Department of Public Works
900 S. Fremont Avenue
Alhambra, CA 91803

Mr. Gary Hildebrand
Los Angeles County Flood Control District
County of Los Angeles Department of Public Works Watershed Management Division, 11th Floor
900 S. Fremont Avenue
Alhambra, CA 91803-1331

(c) Separate Accounting and Auditing. The GWMA will establish a separate account to track revenues and expenses incurred by the GWMA on behalf of the Permittees. Any Permittee may upon five (5) days written notice inspect the books and records of the GWMA to verify the cost of the services provided and billed by GWMA. GWMA shall prepare and provide to the Permittees annual financial statements and audits, after review and approval by the Permittees.

(d) Amendment. The terms and provisions of this MOU may not be amended, modified or waived, except by a written instrument signed by all Parties and approved by all Parties as substantially similar to this MOU.

(e) Waiver. Waiver by either the GWMA or a Permittee of any term, condition, or covenant of this MOU shall not constitute a waiver of any other term, condition, or covenant. Waiver, by the GWMA or a Permittee, to any breach of the provisions of this MOU shall not constitute a waiver of any other provision or a waiver of any subsequent breach of any provision of this MOU.

(f) Law to Govern: Venue. This MOU shall be interpreted, construed, and governed according to the laws of the State of California. In the event of litigation between the Parties, venue shall lie exclusively in the County of Los Angeles.

(g) No Presumption in Drafting. The Parties to this MOU agree that the general rule than an MOU is to be interpreted against the Parties drafting it, or causing it to be prepared, shall not apply.

(h) Severability. If any term, provision, condition or covenant of this MOU is declared or determined by any court of competent jurisdiction to be invalid, void, or unenforceable, the remaining provisions of this MOU shall not be affected thereby and this MOU shall be read and construed without the invalid, void, or unenforceable provisions(s).

(i) Entire Agreement. This MOU constitutes the entire agreement of the Parties with respect to the subject matter hereof and supersedes all prior or contemporaneous agreements, whether written or oral, with respect thereto.

(j) Counterparts. This MOU may be executed in any number of counterparts, each of which shall be an original, but all of which taken together shall constitute but one and the same instrument, provided, however, that such counterparts shall have been delivered to all Parties to this MOU.

(k) Legal Representation. All Parties have been represented by counsel in the preparation and negotiation of this MOU. Accordingly, this MOU shall be construed according to its fair language.

(l) Agency Authorization. Each of the persons signing below on behalf of the Parties represents and warrants that he or she is authorized to sign this MOU on their respective behalf.

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE:_____

LOS ANGELES GATEWAY REGION INTEGRATED REGIONAL WATER MANAGEMENT JOINT POWERS AUTHORITY

_____
Christopher S. Cash
GWMA Chair

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____ CITY OF BELLFLOWER

_____
Jeffrey L. Stewart, City Manager
City Manager

ATTEST:

_____
Debra Bauchop
City Clerk

APPROVED AS TO FORM:

_____
Joseph W. Pannone
City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____

CITY OF LONG BEACH HARBOR DEPARTMENT, acting by and through its Board of Harbor Commissioners

_____, 2014

_____
A.J. Moro
Acting Executive Director
Long Beach Harbor Department

The foregoing document is hereby approved as to form.

Charles Parkin, City Attorney

_____, 2014

_____
Barbara McTigue
Deputy City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____ CITY OF LAKEWOOD

_____
Todd Rogers
Mayor

ATTEST: APPROVED AS TO FORM:

_____ _____
Denise Hayward Steve Skolnick
City Clerk City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____ CITY OF LONG BEACH

_____
Patrick H. West
City Manager

ATTEST:

_____
Larry Herrera
City Clerk

The foregoing document is hereby approved as to form.

Charles Parkin, City Attorney

_____, 2014 _____
Barbara McTigue
Deputy City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____

CITY OF LOS ANGELES, by its Board of Harbor Commissioners

_____
GARY LEE MOORE
Interim Executive Director

ATTEST:

Amber M. Klesges
Acting Board Secretary

APPROVED AS TO FORM AND LEGALITY:

_____, 2014
Michael N. Feuer, City Attorney
Janna B. Sidley, General Counsel

By: _____
Ken Mattfeld, Deputy City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____ CITY OF PARAMOUNT

_____
Diane J. Martinez
Mayor

ATTEST:

_____
Lana Chikami
City Clerk

APPROVED AS TO FORM:

_____
John E. Cavanaugh
City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____

CITY OF RANCHO PALOS VERDES

_____
Jerry Duhovic
Mayor

ATTEST:

_____
Carla Morreale
City Clerk

APPROVED AS TO FORM:

_____
Carol W. Lynch
City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____ CITY OF ROLLING HILLS

_____
B. Allen Lay
Mayor

ATTEST:

_____
Heidi Luce
City Clerk

APPROVED AS TO FORM:

_____
Michael Jenkins
City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____

CITY OF ROLLING HILLS ESTATES

_____
Judith M. Mitchell
Mayor

ATTEST:

_____
Douglas R. Prichard
City Clerk

APPROVED AS TO FORM:

_____
Donald M. Davis
City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____

CITY OF SIGNAL HILL

_____
Ken Farfsing
City Manager

ATTEST:

_____
Kathee Pacheco
City Clerk

APPROVED AS TO FORM:

_____
David J. Aleshire
City Attorney

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____ COUNTY OF LOS ANGELES

_____
Gail Farber
Director of Public Works

APPROVED AS TO FORM:

_____
John F. Krattli
County Counsel

IN WITNESS WHEREOF, the Parties hereto have caused this MOU to be executed on their behalf, respectively, as follows:

DATE: _____

LOS ANGELES COUNTY FLOOD CONTROL DISTRICT
County of Los Angeles
Department of Public Works
Watershed Management Division,11th Fl.
900 South Fremont Avenue
Alhambra, CA 91803-1331

By: _____
Chief Engineer

APPROVED AS TO FORM:

John F. Krattli
County Counsel

_____
Associate

EXHIBIT "A"
Cost Share Tables and Formula

Tables 1 and 2

Exhibit A, Table 1 - Cost Share Summary

Cost Share 2014-2018 (5 years)						Average Annual Cost*
RMC Member	**Area (mi^2)**	**Area Cost**	**Base Cost**	**Costs Paid to Date**	**Total Cost**	
LACFCD Contribution (flat 10%)	- -	- -	$266,491	$0	$266,491	$53,298
Bellflower	4.39	$76,622	$66,623	$0	$143,245	$28,649
Lakewood	7.53	$131,427	$66,623	$0	$198,050	$39,610
Long Beach	39.46	$688,728	$66,623	$0	$755,350	$151,070
Port of Long Beach	11.35	$198,101	$66,623	($219,909)	$44,814	$8,963
Los Angeles and Port of Los Angeles	20.35	$355,185	$133,245	($219,909)	$268,521	$53,704
Paramount	1.72	$30,021	$66,623	$0	$96,643	$19,329
Rancho Palos Verdes	3.00	$52,361	$66,623	$0	$118,984	$23,797
Rolling Hills	0.92	$16,058	$66,623	$0	$82,680	$16,536
Rolling Hills Estate	0.35	$6,109	$66,623	$0	$72,732	$14,546
Signal Hill	2.18	$38,049	$66,623	$0	$104,672	$20,934
Unincorporated	0.36	$6,283	$66,623	$0	$72,906	$14,581
Totals	**91.61**	**$1,598,945**	**$1,065,963**	**($439,819)**	**$2,225,089**	**$445,018**

*Monitoring costs will vary from year to year however costs will be averaged over the 5 year monitoring program.

The average amount will be invoiced yearly.

Exhibit A, Table 2 - Greater LA Harbor Toxics TMDL Estimated Cost Share Formula

Cost Share 2014-2018 (5 years)						
RMC Member	**Area (mi^2)**	**Area Cost**	**Base Cost**	**Costs Paid to Date**	**Total Cost**	**Average Annual Cost***
LACFCD Contribution (flat 10%)	- -	- -	$266,491	$0	$266,491	$53,298
Bellflower	4.39	$76,622	$66,623	$0	$143,245	$28,649
Lakewood	7.53	$131,427	$66,623	$0	$198,050	$39,610
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Unincorporated	0.36	$6,283	$66,623	$0	$72,906	$14,581
Totals	**91.61**	**$1,598,945**	**$1,065,963**	**($439,819)**	**$2,225,089**	**$445,018**

Individual NPDES Permits	Area (mi2)	Area Cost	Facility Fees	Paid to Date	Total Cost	Average Annual
0 permits	**- -**	**- -**	**$0**	**$0**	**$0**	**$0**
		Per Permit:	*$61,500*		*Per Permit:*	*$12,300*

Costs Per Activity										
Activity	***Prior to 2014******	***2014***	***2015***	***2016***	***2017***	***2018***	***Total to 2018******	***Paid***	***Total Cost***	***Average Annual Cost***
Monitoring	*$0*	***$262,000***	***$229,000***	***$572,000***	***$257,000***	***$606,320***	*$1,926,320*	*$0*	*$1,926,320*	*$385,264*
*RMC Administration***	*$0*	***$28,500***	*$30,210*	*$32,023*	*$33,944*	*$35,981*	*$160,657*	*$0*	*$160,657*	*$32,131*
*Development costs** - Bight work*	*$439,819*	*$4,418*	*$4,418*	*$4,418*	*$4,418*	*$4,418*	*$513,122*	*($439,819)*	*$73,303*	*$14,661*
*Development costs** - RMC Related*		*$10,243*	*$10,243*	*$10,243*	*$10,243*	*$10,243*				
SUBTOTAL	*$439,819*	*$305,161*	*$273,871*	*$618,683*	*$305,605*	*$656,961*	*$2,600,099*	*($439,819)*	*$2,160,280*	*$432,056*
TOTAL WITH 3 % GWMA***	***$439,819***	***$314,315***	***$282,087***	***$637,244***	***$314,773***	***$676,670***	***$2,664,908***	***($439,819)***	***$2,225,089***	***$445,018***

RMC Members	
Agencies (30/60 split)	12
LACFCD (10% split)	1
Individual NPDES Permits	0
Total	13

Cost Share Breakdown	
Base Cost*	30%
Area Cost	60%
LACFCD Contribution	10%
Total	100%

**Development costs Cost Breakdown	
Bight work	$242,000
RMC-Related***	$271,122
Total	$513,122

***RMC-Related	
CCMRP Development	$70,000
PQAPP Development	$60,000
MS4 Integration	$20,000
Meeting Facilitation	$78,956
Estimated CCMRP Finalization	$20,000
Estimated Meeting Facilitation: 9/2013 through 6/2014	$22,166

Rates	
Number of Years	5
Admin Yearly Rate Increase**	6%
GWMA Administration	3%

*Monitoring costs will vary from year to year however costs will be averaged over the 5 year monitoring program. The average amount will be invoiced yearly.

**The Admin Yearly Rate Increase accounts for inflation, unforeseen coordination such as meetings with the Regional Board, and monitoring false starts. Only actual costs will be invoiced.

***Previous development costs are not subject to the 3% GWMA administration fee

Permittee costs will be adjusted based on the number of individual NPDES permitees that participate

EXHIBIT "B"
Consultant Scope of Work

March 2014

STATEMENT OF QUALIFICATIONS

ANCHOR QEA

Compliance Monitoring Services for the Greater Harbor Waters Regional Monitoring Coalition

Submitted by Anchor QEA

ANCHOR QEA

27201 Puerta Real, Suite 350
Mission Viejo, California 92691
Phone 949.347.2780

March 24, 2014

Anthony Arevalo
Storm Water Management, City of Long Beach Department of Public Works
333 West Ocean Boulevard
Long Beach, California 90802

Re: Statement of Qualifications for Compliance Monitoring Services for the Greater Harbor Waters Regional Monitoring Coalition

Dear Mr. Arevalo:

On behalf of Anchor QEA, LLC, I am pleased to provide this Statement of Qualifications for compliance monitoring services for the Greater Los Angeles and Long Beach Harbor Waters as specified in the amendment to the *Water Quality Control Plan – Los Angeles Region* (Basin Plan Amendment) to incorporate the *Final Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants Total Maximum Daily Loads* (Harbor Toxics TMDL). We thoroughly understand all compliance monitoring requirements and have assembled a team of qualified professionals to successfully complete all field monitoring, laboratory analysis, and data management elements on behalf of the Greater Harbor Waters Regional Monitoring Coalition (RMC).

Anchor QEA is very familiar with this project and the effort needed to successfully meet the RMC's objectives within the required schedule. Anchor QEA will be supported by several local firms: Calscience Environmental Laboratories, Inc.; Physis Environmental Laboratories, Inc.; Nautilus Environmental; Port Gamble Environmental Services; EcoAnalysts; Seaventures Inc.; and Leviathan Environmental Services, LLC.

I will lead the team with technical assistance from Drs. Shelly Anghera and Wendy Hovel. As the project manager, I will work closely with RMC members dedicated to program oversight as well as with you (the primary RMC point-of-contact to the Gateway Cities Council of Governments) to manage monitoring and administrative tasks efficiently to ensure compliance monitoring and reporting schedules are met. For this program to be successful, the RMC needs a team with experience and resources to conduct sediment, water, and fish tissue field sampling activities; a team capable of understanding and interpreting the compliance monitoring results for TMDL compliance points; and a team with trusted relationships within the RMC and regulatory agencies.

Team with Experience and Resources to Conduct Sampling Activities.
Anchor QEA has conducted water and sediment quality monitoring programs throughout Southern California. Our experience includes stormwater monitoring, receiving water monitoring, sediment and benthic infauna collections for assessing sediment quality according to various methods. We have conducted long-term monitoring programs in the Los Angeles/Long Beach Harbor, Eastern San Pedro Bay, Alamitos Bay, Newport Bay, and San Diego Bay. Our field staff and project managers include environmental scientists, fisheries biologists, marine ecologists, toxicologists, and geologists. Our local office maintains three sampling vessels, water quality instrumentation and sampling apparatuses, and multiple sediment sampling devices. We have strong teaming relationships with two subcontractors, Seaventures and Leviathan Environmental Services, capable of providing larger vessels and appropriate nets and trawls for collecting fish samples.

Team Capable of Understanding and Interpreting Compliance Monitoring Results.
In addition to reporting and managing compliance monitoring generated data, Anchor QEA is well qualified to understand and interpret results relative to the Harbor Toxics TMDL compliance measures. Shelly and Wendy, technical advisors to the project team, have been involved in the review and development of the Sediment Quality Objective (SQO) tools for Parts 1 and 2. Understanding the development of these tools allows Anchor QEA to properly interpret results in light of various confounding issues. Our team members lead the method development and interpretation of toxicity identification evaluations (TIEs) to discern causative agents to toxic impairments.

Team with Trusted Relationships with the RMC and Regulatory Agencies.
Anchor QEA has been involved with the development and coordination of the RMC since its inception. Originally contracted by the Ports of Long Beach and Los Angeles (Ports) to develop and manage the strategic approach to addressing Harbor Toxics TMDL requirements, we recognized that the Ports and the remaining named responsible parties would mutually benefit from a coordinated approach to compliance monitoring activities. We facilitate the RMC meetings and are committed to maintaining the communication and responsiveness to this group throughout the program. Furthermore, in our role with the Ports, we developed strong relationships with the State Water Resources Control Board and Regional Water Quality Control Board through interactions during monthly meetings to ensure the Harbor Toxics TMDL-related special studies and compliance monitoring activities are conducted in the most scientifically sound way to best inform compliance and updates at the reopener in 2018.

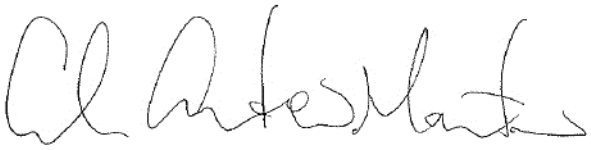
Lastly, I am proud to represent such a qualified team as the project manager. I have more than 15 years of experience managing large-scale monitoring projects similar to the Harbor Toxics TMDL compliance monitoring program for the Greater Harbor Waters both nationally and internationally. Over the past 10 years, I have developed relationships with local and regional regulators on a variety of stormwater, receiving water monitoring, sediment characterization, and dredge material management projects. I am confident

that, working together with the RMC, we can successfully complete all required compliance monitoring and reporting elements of the Harbor Toxics TMDL.

Thank you for giving us the opportunity to provide this proposal. In the following pages, we present details about Anchor QEA, local staff committed to this project, relevant project experience, an overview of our program approach and cost estimate.

We look forward to continuing our relationship with the RMC and to provide each participating member exceptional service.

Sincerely,



Andrew Martin
Managing Environmental Scientist
Anchor QEA, LLC

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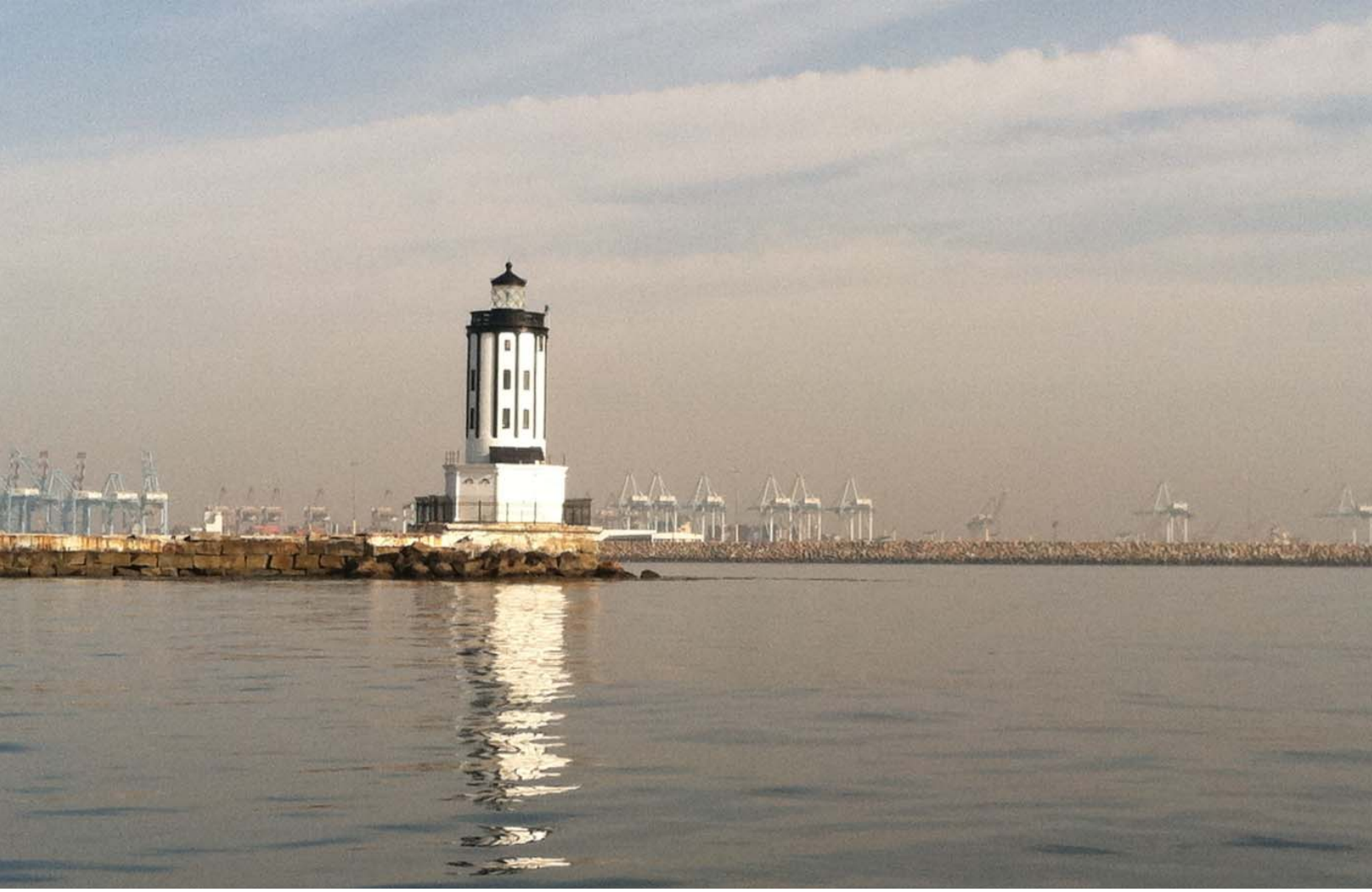


INTRODUCTION TO THE TEAM

Anchor QEA is the region's leader in water and sediment quality monitoring, including Sediment Quality Objective (SQO) assessments, total maximum daily load (TMDL) development, and contaminated sediment management.

To support the Greater Harbor Waters Regional Monitoring Coalition (RMC), Anchor QEA has carefully selected key local firms to assist with implementing compliance monitoring. This selective process resulted in an exceptional team that has unique knowledge to implement a program that is consistent with the RMC's goals. Members of our team have worked closely together for more than 10 years and have created strong, efficient, and collaborative working relationships with each other. We are confident that our team will respond quickly and efficiently to meet the RMC's needs.

.

Anchor QEA Team Highlights

Analytical chemistry laboratories passed regional laboratory inter-calibration studies conducted by Southern California Coastal Water Research Project.

All team members have participated in Southern California Regional Monitoring Programs.

Having multiple team members to fulfill each role ensures capacity to complete all field sampling and laboratory analyses.

Anchor QEA

Role: Project Management, Field Sampling, Data Management and Reporting, RMC Meeting Coordination

Anchor QEA is a nationally recognized environmental and engineering consulting firm that specializes in aquatic, shoreline, and water resource projects. We have extensive experience and expertise assisting municipalities, ports, harbor operations, and permit holders with environmental support services. Anchor QEA has developed a reputation of providing value to our clients in the areas of water and sediment quality services, such as stormwater, surface water and groundwater monitoring; source tracking, sediment characterization; dredge material suitability determinations; short- and long-term sediment management planning; sediment remediation; engineering design support; TMDL support; and permitting. We work with both public and private sector clients on some of the most challenging sites in the nation, and our completed projects are among the most successful in the industry. The strength Anchor QEA brings to each and every project reflects our core values of technological leadership, integrity, superior product quality, and client satisfaction.

Anchor QEA has maintained as-needed and environmental management contracts with the Port of Long Beach, Port of Los Angeles, and City of Long Beach for 5 years. Currently, we are the Ports of Long Beach and Los Angeles' (Ports') selected firm to develop a strategic approach and management alternatives for the *Final Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters Toxic Pollutants Total Maximum Daily Loads* (Harbor Toxics TMDL). Compliance monitoring activities are a requirement of the Harbor Toxics TMDL, and a coordinated approach to compliance monitoring is critical to best inform regional management decisions affecting all named responsible parties; therefore, Anchor QEA facilitated the creation of the RMC and developed the Coordinated Compliance Monitoring and Reporting Plan (CCMRP).

Calscience Environmental Laboratories, Inc.

Role: Analytical Chemistry

Calscience Environmental Laboratories, Inc. (Calscience), located in Garden Grove, has been providing analytical testing of environmental matrices since 1986. They offer a comprehensive portfolio of analytical methods, and their analytical expertise encompasses all environmental matrices including air, groundwater, seawater, sediment, soil, wastewater, and tissue. Calscience is certified under the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP) and the National Environmental Laboratory Accreditation Program (NELAP).

Physis Environmental Laboratories, Inc.

Role: Analytical Chemistry

Physis Environmental Laboratories, Inc. (Physis), located in Anaheim, provides general and specialized chemistry support with standard and custom in-line production of low and ultra-low level performance-based method detections. They analyze stormwater and marine water, sediment, bio-accumulative animal and plant tissue, and aerial deposition samples meeting standard detection levels, lower reporting levels and ultra-low sediment effects range low, and fish contaminant goals. Physis is a California Department of Public Health ELAP-certified laboratory.

Nautilus Environmental

Role: Biological Testing

Nautilus Environmental, located in San Diego, has been providing toxicity testing and field collection services since 2004. They specialize in National Pollutant Discharge Elimination System (NPDES) permit compliance, toxicity identification evaluations (TIEs), environmental monitoring, water and sediment quality, and bioassessment. At the core of the business is their accredited environmental toxicology laboratory, which offers a full range of toxicity, bioaccumulation, and bioavailability testing services for water, sediment, and soil samples. Nautilus is a California Department of Public Health ELAP-certified laboratory.

Port Gamble Environmental Services

Role: Biological Testing

Port Gamble Environmental Sciences, LLC (PGES), located in Port Gamble, Washington, is a consulting and laboratory services group that operates an aquatic testing laboratory to assist in assessing site-specific biota-contaminant relationships. They conduct aquatic and sediment toxicity tests and bioaccumulation and bioavailability tests; perform site-specific evaluations for a variety of tropical, subtropical, and temperate organisms; and perform various specialized tests including NPDES and TIEs. They have extensive experience supporting projects conducted throughout Southern California. PGES is nationally accredited under the NELAP program and has state accreditation by Washington State Department of Ecology.

EcoAnalysts

Role: Benthic Infauna Community Analyses

EcoAnalysts, located in Moscow, Idaho, provides habitat assessment, biological monitoring, and taxonomy services. They specialize in start-to-finish habitat assessment and bioassessment services, including in-field collection and taxonomy of macroinvertebrates, fish, phytoplankton, periphyton, and zooplankton. Since 1995, EcoAnalysts has grown to become a recognized leader in the bioassessment industry as a result of their performance providing taxonomic determinations and rigorous internal quality assurance and quality control (QA/QC) measures. They have conducted benthic infauna community analyses to support the Southern California Bight Regional Monitoring Programs.

Seaventures, Inc.

Role: Vessel Support

Seaventures, Inc., located in Dana Point, has been owned and operated by U.S. Coast Guard-licensed Masters (100-ton certification) since 1977. They own and operate a 42-foot fishing vessel modified for environmental sampling. Seaventures maintains and provides specialized environmental sampling equipment, including a variety of fish trawls and nets. They have experience supporting an array of projects, including scientific research, environmental monitoring, and field sample collection.

Leviathan Environmental Services, LLC

Role: Vessel Support

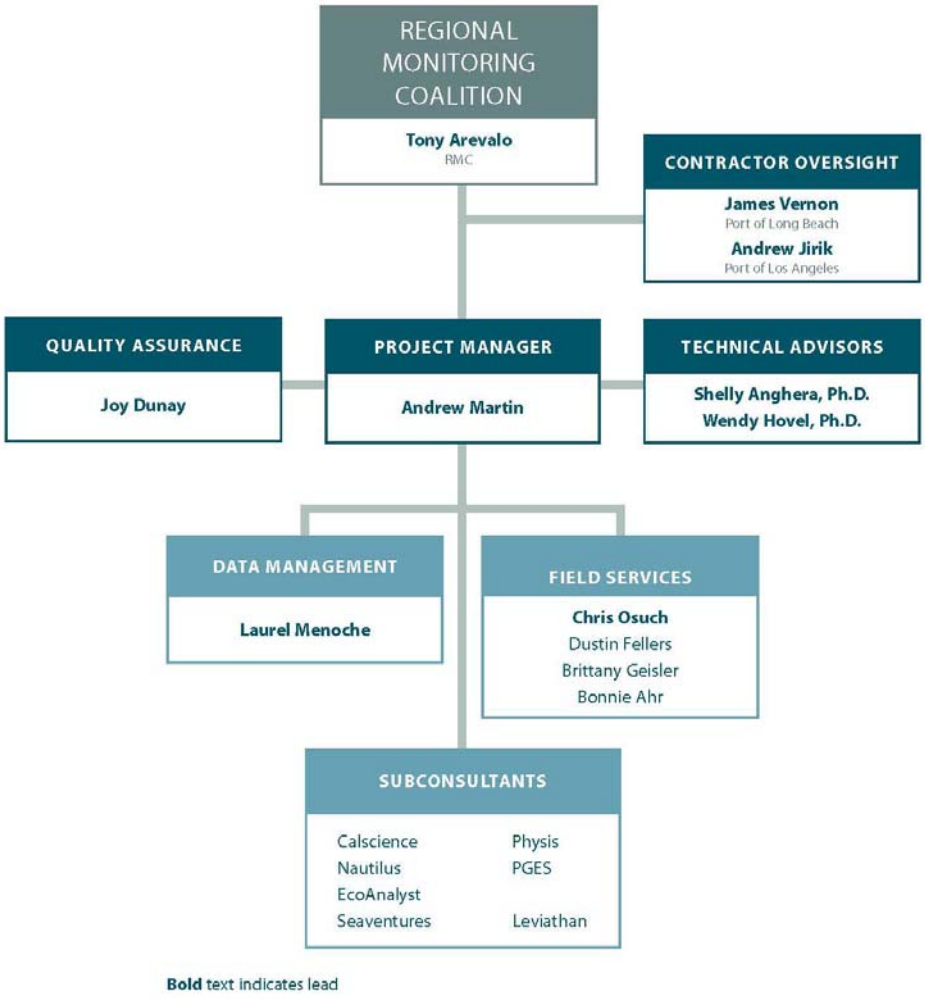
Leviathan Environmental Services, LLC (Leviathan), located in Pleasant Hill, is a marine and aquatic research support enterprise. They have extensive experience in marine and aquatic investigations, including field management, field sampling, planning, research, vessel operations, dredge material disposal studies, water quality, stormwater, health and safety, and terrestrial site investigations. They provide cost-effective research support for clients in need of mobile vessels and equipment to safely satisfy project requirements.

KEY PROJECT STAFF

The Anchor QEA team offers the RMC extensive experience in all aspects of aquatic environmental services and has well-established expertise in sediment, water, and tissue quality testing (i.e., using biological, chemical, and toxicological methods). Anchor QEA and our subconsultants have worked closely together for more than 10 years and in that time have created trusted working relationships. We are confident that our team will respond quickly and efficiently to meet the RMC's needs.

The technical areas of expertise, roles and responsibilities, and lines of communication of each Anchor QEA team member are presented in our organizational chart and summarized on the following pages. Resumes for key staff are attached.

Organizational Chart



Bold text indicates lead

Staff Experience Summaries

Staff Member and Role	Experience Summary
Andrew Martin Project Manager	• Experience managing and implementing large-scale field sampling programs in coastal regions throughout the United States. He currently leads the Ports' field program and has designed and assembled field programs requiring regulatory approvals. These studies have been executed efficiently, and all expectations were achieved.
Shelly Anghera, Ph.D. Technical Advisor	• Experience conducting field and laboratory studies related to marine eco-toxicology and sediment quality characterization. Her expertise centers on field study design, sediment characterization, water and sediment testing and analysis, implementation strategies for TMDL compliance, and SQO application. Shelly currently leads TMDL strategic support for the Ports.
Wendy Hovel, Ph.D. Technical Advisor	• Experience providing management and technical support for many large, multi-disciplinary sediment investigations, including those focused on sediment chemical and toxicological characterization, dredge material evaluations, contaminated sediment management, specialized studies (e.g., sediment contaminant flux and toxicity identification evaluation), ecological risk assessment, TMDLs, and bioaccumulation potential assessments and modeling. Wendy led development of the Programmatic Quality Assurance Project Plan (PQAPP).
Chris Osuch Field Manager	• Experience conducting dredge material evaluations, sediment characterizations, and water quality monitoring. He assists Andrew the Ports' field programs.
Joy Dunay QA Manager	• Experience performing analytical chemistry-related tasks including analytical method selection for regulatory requirements, data validation, and QA for various study objectives. She assisted Wendy during PQAPP development.
Laurel Menoche Data Manager	• Experience working with relational databases within Microsoft Access, Microsoft SQL Server, Visual FoxPro, and FoxPro, including designing, querying, importing, exporting, maintaining, and providing QA/QC.
Brittany Geisler Field Support	• Experience conducting water and sediment quality monitoring programs throughout Southern California.
Dustin Fellers Field Support	• Experience conducting water and sediment quality monitoring programs throughout Southern California.
Bonnie Ahr Field Support	• Experience collecting and identifying fish as well as conducting a fish tracking study throughout San Pedro Bay.

Andrew Martin
Project Manager

Andrew Martin is a managing environmental scientist with more than 18 years of multi-disciplinary environmental science data collection, interpretation, and presentation expertise. He has designed, implemented, and managed a variety of programs in the marine environment and surrounding watersheds. He is skilled in collecting sediment, water, and biological samples; performing dry weather and stormwater monitoring; and investigating contaminant sources via contaminant fate and transport studies and marine biological habitat surveys. In addition, Andrew has a thorough understanding of project-specific and regional sediment management requirements and has developed dredge material management plans, long-term management strategies, and beneficial use alternative strategies. He has managed programs to support development of TMDLs, Environmental Impact Statements, NPDES permit requirements, special research studies, and ecological emergency response activities (i.e., Natural Resource Damage Assessments). Andrew also has extensive expertise in hydrographic, oceanographic, geophysical, and dive surveying. He applies innovative technological methods to more accurately and extensively collect environmental data.

For this project, Andrew will be the project manager. He will work closely with the RMC and designated points-of-contact and be responsible for scheduling, coordinating, and directing all field sampling, analytical testing, and reporting to ensure all project objectives are met.

Shelly Anghera, Ph.D.
Technical Advisor

Dr. Shelly Anghera is a principal scientist with more than 17 years of experience conducting field and laboratory studies related to marine eco-toxicology and sediment quality characterization. Shelly has focused on providing specialized environmental services for the Ports for the past 10 years. Her expertise centers on field study design, sediment characterization, water and sediment testing and analysis, implementation strategies for TMDL compliance, and SQO application. Shelly has taught courses on TMDLs, toxicity testing, SQO, and ecological risk in contaminated sediments. Her projects often focus on the integration of multiple lines of evidence to determine sediment quality for dredged material, beneficial reuse of contaminated sediments, and sediment TMDL implementation planning. Recent projects include Port-Wide Sediment Management Plans, TMDL support, water quality monitoring, and sediment and water quality characterization within the Los Angeles/Long Beach Harbor in support of the Water Resource Action Plan (WRAP).

For this project, Shelly will be a technical advisor. In addition to program management oversight and assistance, she will assist with interpreting analytical data relative to compliance measures, as required by the Harbor Toxics TMDL.

Wendy Hovel, Ph.D.

Technical Advisor

Dr. Wendy Hovel is a managing environmental scientist with 17 years of experience. Her expertise centers on sediment characterizations, specialized studies (e.g., sediment contaminant flux and toxicological investigations), beneficial reuse alternatives assessments, sediment toxicity identification evaluations, sediment management, TMDLs, and bioaccumulation potential assessments. Wendy has managed or provided technical advice on projects for many large, multi-disciplinary sediment investigations, including those for a number of U.S. Army Corps of Engineers (USACE) districts and divisions (e.g., New Orleans, New York/New Jersey, New England, Los Angeles, and Wilmington), Ports (e.g., Los Angeles and Long Beach), and the U.S. Navy (e.g., Pacific Division [Naval Facilities Engineering Command]). As part of these projects, specialized programs were required to statistically assess sediment chemistry data gaps, delineate the spatial extent of sediment contamination, or design and implement specialized analytical tests.

For this project, Wendy will be a technical advisor. She will assist with evaluating chemistry and toxicity test procedures and provide recommendations for alternative testing, as necessary.

Chris Osuch

Field Manager

Chris Osuch is a senior scientist with more than 13 years of professional experience. His areas of technical expertise include dredge material evaluations and management, sediment characterizations, water quality monitoring programs, aquatic toxicology, and TMDLs. He has managed multiple dredge material evaluations to determine suitability for open-water disposal, beneficial reuse, or upland placement as well as water quality monitoring projects to assess impacts of discharge. Chris is currently functioning as the field coordinator for Anchor QEA's California offices and has managed multiple sediment, water quality, and benthic macroinvertebrate sampling programs. He has experience with a wide variety of sampling techniques, including the use of a vibracore, piston core, box core, diver core, Van Veen, Ekman, petite ponar, Seabird CTD, and various water quality meters (e.g., YSI, Hydrolab, Orion).

For this project, Chris will be the field manager. He will lead and execute all field sampling activities.

Joy Dunay

QA Manager

Joy Dunay is an environmental scientist with more than 14 years of experience in the environmental industry, with an emphasis in analytical chemistry. She has extensive management experience with high-profile projects, including Superfund sites, which require a high level of data scrutiny, interpretation, and reporting. Joy manages the chemistry group at Anchor QEA, which oversees laboratory and analytical method selection, QA of analytical data (collection and analysis), and data validation using prescribed project documentation or U.S. Environmental Protection Agency (USEPA) functional guidelines. Joy is a recognized leader in method development and implementation of specialized chemistry studies. In addition to project chemistry tasks, she leads the development of PQAPPs, Sampling and Analysis Plans, and Data Reports. Joy also has extensive field experience using "clean hands" techniques for the collection of sediment, soils, groundwater, and air and often leads field audits with regulators.

For this project, Joy will be the QA manager. She will provide a QA/QC review on all field measurements, laboratory analytical reports, and compliance monitoring reports.

Laurel Menoche

Data Manager

Laurel Menoche is an environmental scientist with 12 years of experience working with relational databases within Microsoft Access, Microsoft SQL Server, Visual FoxPro, and FoxPro, including designing, querying, importing, exporting, maintaining, and providing QA/QC. She is also proficient with Microsoft Excel, including running calculations and statistics and creating charts and tables.

For this project, Laurel will be the data manager. She will be responsible for maintaining all field measurements and laboratory analytical results in a project database and for coordinating the distribution of these data to the RMC and the Regional Water Quality Control Board (RWQCB) as required by the Harbor Toxics TMDL.

RELEVANT PROJECT EXPERIENCE

Anchor QEA is currently supporting our clients respond to TMDL requirements and conducting long-term site assessments and compliance monitoring projects throughout Southern California. Our ongoing TMDL projects range from designing, modeling, and conducting special studies to assist the Ports by addressing concerns during the Harbor Toxics TMDL reopener, to compliance monitoring as required by the Colorado Lagoon TMDL, and coordinating and educating stakeholders on potential future TMDLs. Our continuing long-term monitoring projects include multidisciplinary sample collections to evaluate the performance of two regional confined aquatic disposal (CAD) capping projects and water quality monitoring associated with dredging operations.

The following six projects were selected to highlight our understanding of the Harbor Toxics TMDL and recent experience in conducting long-term, multi-disciplinary monitoring programs within San Pedro Bay and the region.

SUMMARY OF RELEVANT ANCHOR QEA PROJECTS IN THE REGION

Project and Client Name	Relevant Elements
Harbor Toxics TMDL Strategic Management Approach Ports of Long Beach and Los Angeles	• Water quality monitoring • Sediment quality monitoring • Fish tissue and benthic infauna collection • Toxicity evaluation • SQO • Long-term monitoring • Compliance reporting • Database management • Meeting facilitation • Agency interaction and negotiation
Colorado Lagoon TMDL Support City of Long Beach	• Water quality monitoring • Sediment quality monitoring • Fish tissue collection • Toxicity evaluation • Long-term monitoring • Compliance reporting
Rhine Channel and Lower Newport Bay Dredging City of Newport Beach	• Water quality monitoring • Sediment quality monitoring • Toxicity evaluation • Long-term monitoring program • Compliance reporting • Meeting facilitation • Agency interaction and negotiation
Fish Harbor Sediment Characterization Port of Los Angeles	• Sediment quality monitoring • SQO • Database management
North Energy Island Borrow Pit Confined Aquatic Disposal Site Pilot Study U. S. Army Corps of Engineers, Los Angeles District	• Water quality monitoring • Sediment quality monitoring • Benthic infauna analysis • Long-term monitoring program • Compliance reporting • Meeting facilitation • Agency interaction and negotiation
Port of Hueneme Maintenance Dredging Confined Aquatic Disposal Site Construction Oxnard Harbor District	• Water quality monitoring • Sediment quality monitoring • Long-term monitoring program • Compliance reporting • Database management • Meeting facilitation • Agency interaction and negotiation

Harbor Toxics TMDL Strategic Management Approach

Anchor QEA is currently supporting the Ports with development of a strategic approach to meet sediment and water quality limits defined in the Harbor Toxics TMDL. We supported the Ports with the development of technical comments on the draft TMDL, which resulted in the ability to demonstrate compliance using alternative methods, inclusion of special studies to collect needed site-specific contaminant fate and transport and bioaccumulation information, and a reopener in 2018 in which site-specific management alternatives may be applied.

Currently, we are developing monitoring plans and special studies to establish the technical basis for amendments to the Harbor Toxics TMDL during the reopener. We facilitate monthly meetings with the State Water Resources Control Board and RWQCB staff and the Ports. Technical studies, including site-specific bioaccumution model development, site-specific contaminant fate and transport models, source investigations, stressor identification, best management practices effectiveness, and ultra-low detection limit methodologies, are reviewed and approved by the RWQCB prior to implementation to ensure information will be considered during the TMDL reopener. This information will be used to determine the linkage between contaminant sources and impairment to develop remedial actions. These special studies will provide information to evaluate the effectiveness of various management actions in the improvement of water quality.

Furthermore, Anchor QEA is supporting the Ports' development of a strategy for TMDL attainment that allows compliance to be demonstrated through California's SQO Parts 1 (direct effects) and 2 (indirect effects).

Relevant Elements

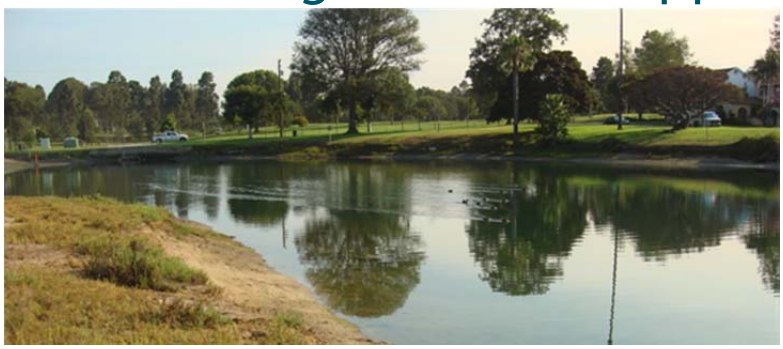
- Water quality monitoring
- Sediment quality monitoring
- Fish tissue and benthic infauna collection
- Toxicity evaluation
- SQO
- Long-term monitoring
- Compliance reporting
- Database management
- Meeting facilitation
- Agency interaction and negotiation

Project Reference

Matt Arms, Port of Long Beach
(562) 590-4160

Kathryn Curtis, Port of Los Angeles
(310) 732-3681

Colorado Lagoon TMDL Support



Anchor QEA was contracted by the City of Long Beach to fulfill the requirements of the Colorado Lagoon TMDL Monitoring Plan (CLTMP).

Colorado Lagoon is a Y-shaped waterbody comprising 29 acres in an urban watershed in Long Beach and is tidally connected to Alamitos Bay via an underground culvert. Colorado Lagoon was 303(d)-listed for sediment quality impacts due to lead, zinc, chlordane, and polycyclic aromatic hydrocarbons (PAHs). A TMDL was developed and subsequently adopted by the RWQCB as a Basin Plan Amendment in 2009 with specific requirements for improvements to water and sediment quality, with considerations to the bioaccumulation of organic contaminants in fish and mussels.

As such, TMDL compliance monitoring is required quarterly (summer, fall, winter, and spring) as detailed in the CLTMP. Compliance monitoring activities include measuring in situ water quality \ and collecting water quality samples for chemical analyses from four stations quarterly. Sediment samples are collected for chemical and biological (i.e., toxicity) analyses from four stations annually. Fish tissue samples of two target species (topsmelt and shiner perch) are collected for chemical analyses from four stations annually. Mussels are collected for chemical analyses from three stations annually. The program requires quarterly reporting and data submittals to the RWQCB.

Relevant Elements

- Water quality monitoring
- Sediment quality monitoring
- Fish tissue collection
- Toxicity evaluation
- Long-term monitoring
- Compliance reporting

Project Reference

Ana DeAnda, City of Long Beach
(562) 570-6032

Rhine Channel and Lower Newport Bay Dredging

Starting in 2003, Anchor QEA (formerly Anchor Environmental) was retained by the City of Newport Beach and Orange County Coastkeeper to serve as the technical lead and project manager for a combined Remedial Investigation/Feasibility Study (RI/FS) and maintenance dredging of the Rhine Channel in Lower Newport Bay. After leading numerous studies—such as surface and subsurface sediment characterization, bathymetry surveys, debris field mapping, and structural engineering surveys of the existing shoreline structures—we prepared a final FS report (2005) that recommended dredging and disposal in either a port fill or an on-site CAD facility.

On behalf of the City of Newport Beach, we assumed the role of lead construction manager for the Rhine Channel dredging program. In this capacity, we oversaw all contractor operations on a daily basis; interacted directly and frequently with City of Newport Beach representatives; managed a team of dredging, water quality, and structural inspectors; and assisted with public outreach.

Following the success of the Rhine Channel dredging program, Anchor QEA assisted the City of Newport Beach in expanding the program to include clean and contaminated areas throughout Lower Newport Bay, resulting in an additional more than 200,000 cubic yards of dredging. We were instrumental in securing the disposal agreement at the Port of Long Beach, developing and implementing the water quality and sediment monitoring program, and assisting City of Newport Beach staff with contractor management, communications, and schedule coordination for the contaminated sediment disposal events at the Port of Long Beach.

Monitoring requirements for both projects consisted of in situ water quality measurements (i.e. temperature, dissolved oxygen, pH, turbidity, salinity) and water sampling for laboratory analysis before, during, and after dredging activities. We worked with the RWQCB to develop special studies that investigated the

Relevant Elements

- Water quality monitoring
- Sediment quality monitoring
- Toxicity evaluation
- Long-term monitoring program
- Compliance reporting
- Meeting facilitation
- Agency interaction and negotiations

Project Reference

Chris Miller, City of Newport Beach
(949) 644-3043

relationship of turbidity to potential biological impacts. Results of these studies refined the compliance monitoring criteria for the region to consider multiple lines of evidence, an evaluation of impact duration, and varying thresholds adjacent and assay from sensitive eelgrass beds in the harbor. As a result of the improved monitoring program, Anchor QEA demonstrated that dredging activities were not resulting in a negative impact to the environment. Confirmatory sediment sampling was also required in multiple areas to ensure the post-dredge substrate met project requirements. We developed monthly and annual compliance monitoring reports according to permit requirements.

Fish Harbor Sediment Characterization

Anchor QEA conducted a sediment characterization study within Fish Harbor in the Port of Los Angeles. The program included collecting sediment samples using a surface grab sampler and vibracore. Surface sediment samples were evaluated in accordance with the SQO Part 1 chemistry line of evidence to better define potential sediment remediation volumes under the Harbor Toxics TMDL. Core samples were subsampled in 2-foot segments in and submitted for chemical analysis to delineate the vertical distribution of chemical contaminants. These data were also used to develop conceptual-level design scenarios for two different potential confined disposal facility (CDF) sites within Fish Harbor.

Relevant Elements

Sediment quality monitoring

SQO

Database management

Project Reference

Kathryn Curtis, Port of Los Angeles
(310) 732-3681

North Energy Island Borrow Pit Confined Aquatic Disposal Site Pilot Study

Anchor QEA designed, managed, and monitored the construction of a pilot CAD site in Long Beach Harbor to support the Los Angeles Contaminated Sediments Task Force (CSTF) and USACE's long-term sediment management documents. The project consisted of dredging 100,000 cubic meters of sediment from the Los Angeles River Estuary and placing it into the nearby North Energy Island Borrow Pit located in the Inner Harbor. To support project design, water current meters were deployed and USACE-developed models were used to understand the fate and transport of sediments during placement activities. Following placement of the contaminated sediment, a 3- to 5-foot-thick sand cap layer was added to the CAD cell to isolate contaminated material from the marine environment.

A long-term (12-year) monitoring program was initiated immediately following construction in 2001 and was completed in 2013. Monitoring activities included:

- *Surface Sediment Sampling.* Sediments were screened and processed for benthic infauna community analyses to evaluate recolonization of the capping site.
- *Sediment Core Sampling.* Subsamples were collected from the overlying sediment, cap material, and contaminated material to confirm the cap sequestered contaminants from the overlying sediments.
- *Overlying and Porewater Sampling.* Receiving water samples and porewater from the cap material were collected to confirm contaminants were not migrating into San Pedro Bay.
- *Bathymetric Surveys.* Maps of the capping site were made to confirm the long-term integrity of the cap.
- *Diver Surveys.* Underwater observations were made to evaluate surface integrity of the cap and document the presence of macroinfauna.

Relevant Elements

Water quality monitoring

Sediment quality monitoring

Benthic infauna analysis

Long-term monitoring program

Compliance reporting

Meeting facilitation

Agency interaction and negotiation

Project Reference

Jim Fields, USACE
(213) 452-3403

Port of Hueneme Maintenance Dredging and Confined Aquatic Disposal Site Construction

Anchor QEA managed engineering design; environmental review; permits components, including National Environmental Policy Act (NEPA), California Environmental Quality Act (CEQA), Essential Fish Habitat (EFH), Clean Water Act (CWA), and Endangered Species Act (ESA); and long-term monitoring activities for maintenance dredging and construction management of a multi-user CAD site in Port Hueneme, California. The CAD facility consisted of an excavated cell designed to contain and sequester contaminated sediments dredged from areas managed by the U.S. Navy (USN), USACE, and Oxnard Harbor District (OHD), such that sediments remained permanently isolated from the surrounding environment. Excavating the CAD cell had the additional benefit of providing clean sand for nourishment of adjacent beaches. The project entailed excavating an approximately 500,000-cubic-meter CAD cell in Port of Hueneme Harbor, nourishing a nearby beach with the excavated material, placing contaminated sediments dredged from the harbor in the CAD cell, and capping the CAD cell with clean sediment and a layer of armor rock.

Anchor QEA provided instrumental support in all aspects of this project, including:

- *Sediment Management.* We developed and implemented sediment characterization plans and evaluated feasible sediment management alternatives (e.g., beach nourishment).
- *Engineering Design.* We developed all environmental and technical details of the project design, including CAD dimensions, volume projections, site geotechnical characteristics, chemical transport modeling, and contract documents.
- *Agency Negotiation.* We coordinated the environmental review and permitting process with numerous state and federal agencies as well as led public outreach activities.
- *Construction Management.* We oversaw all activities, provided

Relevant Elements

- Water quality monitoring
- Sediment quality monitoring
- Long-term monitoring program
- Compliance reporting
- Database management
- Meeting facilitation
- Agency interaction and negotiation

Project Reference

Chris Birkelo, Oxnard Harbor District
(805) 488-3677

all compliance reporting, and conducted intensive water quality monitoring and sediment sampling during construction.

Anchor QEA continues to work with the USN, USACE, and OHD to perform long-term monitoring of the CAD cell. Long-term monitoring activities were designed to confirm the CAD cap is maintaining its physical integrity and ensure the CAD cap continues to sequester underlying contaminants. Long-term monitoring activities include:

- Bathymetric survey
- Sediment core sampling
- Porewater sampling

Long-term monitoring activities conducted to date have shown the design and construction of the CAD cap is performing as designed.

SUMMARY OF RECENT LOCAL SEDIMENT AND WATER QUALITY CHARACTERIZATIONS

	Water Quality Monitoring	Sediment Quality Monitoring	Fish Tissue and Benthic Infauna Collection/ Analysis	Toxicity Evaluation	SQO	Long-Term Monitoring Program	Compliance Reporting	Database Management	Meeting Facilitation	Agency Interaction and Negotiations
Projects (Location)										
Harbor Toxics TMDL Management Approach, San Pedro Bay	●	●	●	●	●	●	●	●	●	●
Colorado Lagoon TMDL Support, Long Beach	●	●	●	●		●	●			
Rhine Channel and Newport Bay Federal Dredging, Newport Beach	●	●		●		●	●		●	●
Fish Harbor Sediment Characterization, Los Angeles Harbor San Pedro Bay		●			●			●		
North Energy Island Borrow Pit Confined Aquatic Disposal Site Pilot Study, Long Beach Harbor, San Pedro Bay	●	●	●			●	●		●	●
Port of Hueneme Maintenance Dredging Confined Aquatic Disposal Site Construction, Port of Hueneme	●	●				●	●	●	●	●
Staff Expertise										
Andrew Martin, Project Manager	●	●	●	●	●	●	●		●	●
Shelly Anghera, Technical Advisor	●	●	●	●	●	●	●		●	●
Wendy Hovel, Technical Advisor	●	●	●	●	●		●	●	●	●
Chris Osuch, Field Manager	●	●	●	●	●	●	●		●	
Joy Dunay, QA Manager	●	●	●	●	●	●	●	●	●	●
Laurel Menoche, Data Manager	●	●	●	●	●		●	●	●	

Photo Credit: nagaelie

APPROACH TO THE PROJECT

The amendment to the *Water Quality Control Plan – Los Angeles Region* (Basin Plan Amendment) to incorporate the Harbor Toxics TMDL specifies compliance monitoring requirements for sediment, water, and fish tissue in the Greater Los Angeles and Long Beach Harbor Waters (including Consolidated Slip; herein referred to as Greater Harbor Waters). The Basin Plan Amendment recommends that responsible parties collaborate or coordinate compliance monitoring efforts to avoid duplication and reduce associated costs. As such, the responsible parties for the Greater Harbor Waters have formed an RMC.

Anchor QEA developed a Draft CCMRP for the RMC's review and submittal to the RWQCB. Compliance monitoring activities as specified in the CCMRP are required to begin 6 months after approval of the CCMRP by the Executive Officer of the RWQCB.

To complete the required compliance monitoring activities, we developed this scope of work in accordance with the CCMRP. The objective of the proposed effort is to conduct all sediment, water, and fish tissue monitoring and develop annual reports for the RMC to submit to the RWQCB.

Task 1: Regional Monitoring Coalition Meeting Management

Anchor QEA will coordinate monthly meetings and provide logistic support and meeting facilitation for the RMC. Responsibilities associated with meeting support include the following:

- Serving as a public point-of-contact for stakeholders regarding general information and coordinating document review and comments
- Scheduling meetings as requested by RMC members
- Developing draft agendas in coordination with RMC members
- Providing meeting materials as needed for RMC meetings
- Researching and responding to inquiries and comments presented by participating responsible parties relative to compliance monitoring activities and the potential to coordinate these activities with other monitoring programs (e.g., MS4 permit), where feasible
- Taking detailed meeting minutes and documenting attendees (meeting minutes include follow-up action items and a summary of agreed decision points)

Objective

Coordinate monthly meetings with the RMC to discuss program requirements and disseminate information related to compliance monitoring activities

Deliverables

- Meeting agenda
- Meeting materials
- Meeting minutes

Assumptions

- Meetings will be held once every 4 to 6 weeks.
- Meetings will be held at either the City of Long Beach or Port of Long Beach.

Task 2: Compliance Monitoring Field Activities

Anchor QEA will coordinate and conduct field activities. As provided in detail in the CCMRP, the monitoring program consists of collecting water and sediment samples at 22 stations and collecting fish tissue samples within four waterbodies. To maintain consistency and to take advantage of coordinated sampling efforts with other regional monitoring programs, sample collection methods will adhere to Southern California Coastal Water Research Project's (SCCWRP's) Regional Bight Monitoring Program or Surface Water Ambient Monitoring Program (SWAMP) monitoring protocols.

Objective

Conduct compliance monitoring activities to collect water, sediment and fish tissue data as required by the Harbor Toxics TMDL

Deliverables

- Monthly status updates on field sampling and sample analyses progress

Water

In situ water quality will be measured and water samples will be collected three times annually (two during wet weather events and one during a dry weather event) at each of the 22 stations. The first large storm of the season will be targeted as one of the two wet weather events and will have a predicted rainfall of at least 0.25 inch with a 70 percent probability of rainfall at least 24 hours prior to the event start time. In situ measurements include temperature, dissolved oxygen, pH, and salinity. Water samples will be collected and submitted for the following parameters:

- Total suspended solids

- Dissolved and total metals
- Organochlorine pesticides (including DDT and its derivatives, chlordane compounds, dieldrin, and toxaphene)
- Polychlorinated biphenyl (PCB) congeners

Flow will not be measured in receiving waters, because mixing and other hydrodynamic factors will confound the flow measurements.

Sediment

Sediment monitoring will be performed twice every 5 years all 22 stations. Surface sediment grab samples will be collected and submitted for chemistry, toxicity, and benthic community analyses in accordance with SQO Part 1 sediment triad assessment. Sediment chemistry analyses will include the following parameters:

- Total organic carbon
- Grain size
- Metals
- PAHs
- Organochlorine pesticides (including DDT and its derivatives, chlordane compounds, dieldrin, and toxaphene)
- PCB congeners

SQO sediment line of evidence toxicity analyses will include an acute amphipod survival test and the chronic, sub-lethal sediment-water interface (SWI) test. Benthic community analyses will be conducted and benthic community condition will be measured using four SQO indices.

Tissue

Fish tissue samples will be collected once every 2 years at only four stations: one in Consolidated Slip, one in Los Angeles Outer Harbor, one in Long Beach Outer Harbor, and one in Eastern San Pedro Bay. Composite samples of three fish species (white croaker, California halibut, and shiner surfperch) will be collected at all stations, except for Consolidated Slip; only white croaker will be collected at this station. Fish tissue samples will be submitted for the following parameters:

- Percent lipids
- Organochlorine pesticides (including DDT and its derivatives, chlordane compounds, dieldrin, and toxaphene)
- PCB congeners

Assumptions

- All field sampling will be conducted in accordance with methods used in the SCCWRP's Regional Bight Monitoring Program or SWAMP compatible programs.
- Wet weather receiving water sampling will be targeted for 24 hours after a storm event occurring between October 1 and April 30.
- Sediment sampling activities occur in 2016 and 2018 and will include all SQO Part 2 lines of evidence for both sampling events.
- SQO Part 1 and fish tissue sampling will only occur between June 1 and September 30.

Task 3: Annual Reporting and Data Management

Anchor QEA will compile all field observations and laboratory analytical data into annual reports for submittal to the RMC. Annual compliance monitoring reports will include the following elements:

- Introduction: an overview of the Harbor Toxics TMDL and objectives of compliance monitoring program.
- Overview of Compliance Monitoring Activities: a summary of required monitoring activities conducted during the reporting year.
- Methods: detailed information relative to sampling and sample analysis techniques.
- Results: presentation of all field observations and laboratory analytical data, including project maps illustrating actual sampling locations.
- QA/QC: a review of results relative to the PQAPP and data validation of analytical laboratory reports.
- Statement of Compliance: a statement of compliance for each Harbor Toxics TMDL-named waterbody. Compliance will be determined via one of four potential means to determine compliance as specified in the Basin Plan Amendment.
- Appendices: copies of field logs, representative photographs, and all laboratory analytical reports.

Objective

Compile all field observations and laboratory analytical data into annual reports for submittal to the RMC

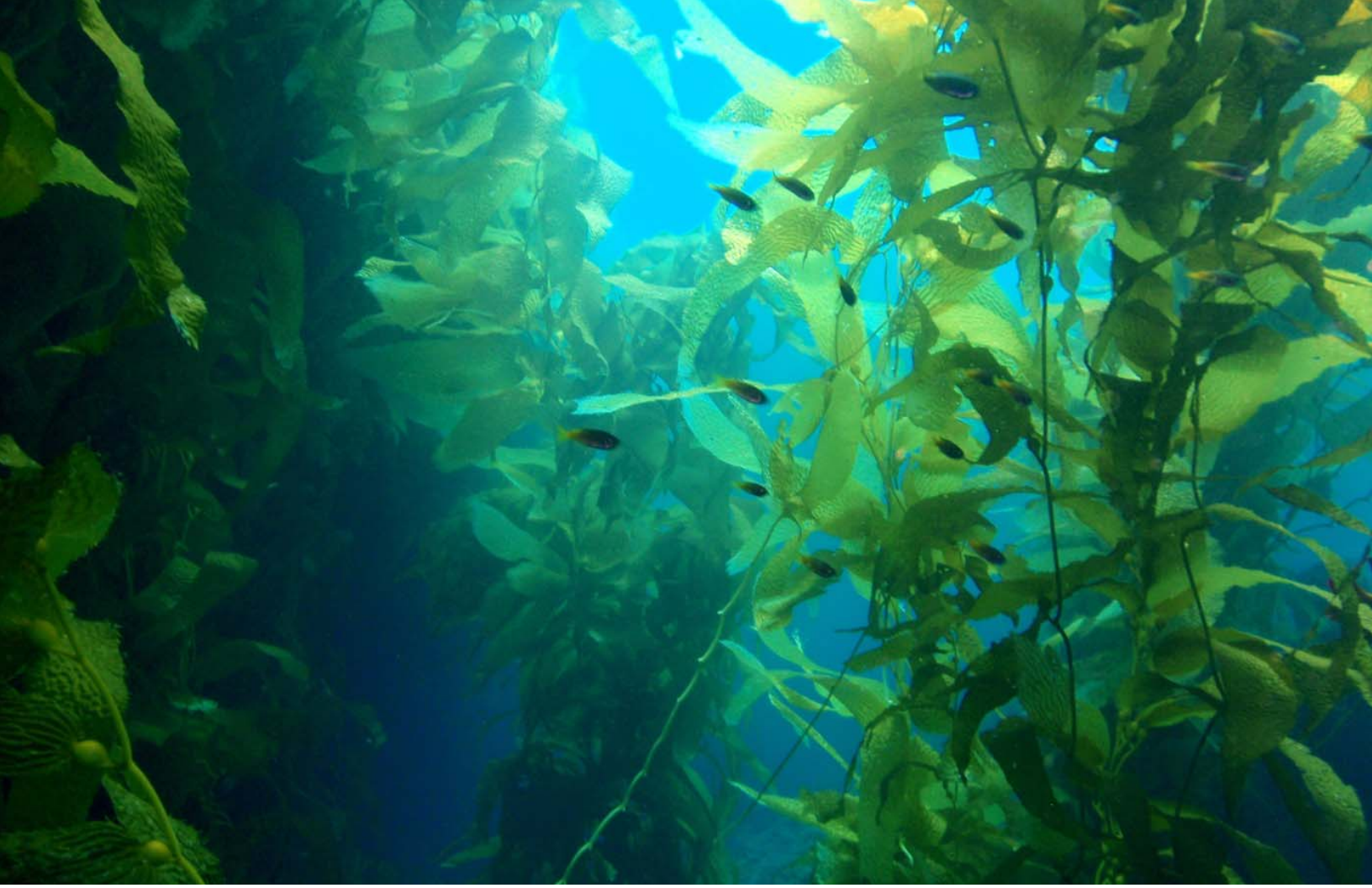
Deliverables

- Draft Annual Monitoring Report for RMC
- Final Draft Annual Monitoring Report for RMC
- Final Annual Monitoring Report for RWQCB
- Electronic data deliverable of field observations and laboratory analytical data for each RMC member

This task also includes all data management activities, such as QA/QC of the laboratory analytical data, database management and electronic deliverable of all data to responsible parties, and project management activities required to ensure successful completion of field sampling, data management, and field reporting.

Assumptions

- A Draft Annual Monitoring Report will be submitted electronically to the RMC by July 31, 2015 (for monitoring activities occurring in calendar year 2014).
- RMC members will have 2 weeks to review the draft report, and Anchor QEA will have 2 weeks to respond to comments and prepare a Final Draft Annual Monitoring Report. A final draft report will be submitted electronically to the RMC by August 31 for confirmation that all comments were appropriately addressed.
- The RMC will submit the Final Annual Monitoring Report to the RWQCB in September.
- All successive annual monitoring reports will follow the same schedule each year.



PROJECT SCHEDULE

The Harbor Toxics TMDL requires compliance monitoring activities to begin 6 months after the monitoring plan is approved by the Executive Officer of the RWQCB and continue annually until the Executive Officer has determined no additional monitoring is necessary (i.e., compliance with the Harbor Toxics TMDL has been achieved) or an amended program is appropriate. The Draft CCMRP was submitted to the RWQCB for approval in June 2013. The RWQCB provided comments to the Draft CCMRP in November 2013; the document was revised and resubmitted for approval in February 2014. Approval is anticipated in March 2014. Therefore, monitoring should begin in September 2014.

Water quality monitoring (one dry weather event during the traditionally lowest flow month and two wet weather events) will be conducted annually.

Sediment sample will be collected every 2 to 3 years to assess sediment quality per SQO Part 1. As per technical guidance for the SQO Part 1 assessment process, sediment samples for chemistry, benthic infauna community analysis, and toxicity should be collected between June 1 and September 30.

Fish tissue samples will be collected biennially (i.e., once every 2 years).

Compliance monitoring reports will be submitted annually beginning within 15 months after monitoring activities started. Annual reports will document compliance monitoring activities relative to a calendar year (i.e., January 1 through December 31). We anticipate draft reports will be submitted to the RMC for review in July 1 of each calendar year. Final draft reports will be submitted to the RWQCB in September of each calendar year.

A proposed schedule of monitoring activities is presented below

RMC meetings are anticipated to occur once every 4 to 6 weeks throughout the course of the project, pending availability of responsible parties and project requirements.

Task	Frequency	2014				2015				2016				2017				2018			
		W	Sp	Su	F	W	Sp	Su	F	W	Sp	Su	F	W	Sp	Su	F	W	Sp	Su	F
Water Quality Monitoring	Annually: 2 wet (◆), 1 dry (◆)	◆		◆	◆	◆		◆	◆	◆		◆	◆	◆		◆	◆	◆		◆	◆
Sediment Sampling (SQO)*	Two per 5 years											●								●	
Fish Tissue Sampling	Biennially			●								●								●	
Reporting	Annually			●				●				●				●				●	

Notes:

Wet weather monitoring occurs between October 1 and April 30. For illustrative purposes, wet weather monitoring is shown to occur in winter and fall. Wet weather monitoring may occur during April (spring), and it is likely two wet weather events may occur in the same season. Similarly for dry weather, it may occur during May or June (spring).

The wet weather season and the reporting schedule are not the same. Annual reports may not include all wet weather monitoring events for a given wet season.

Water quality monitoring includes in situ monitoring (pH, dissolved oxygen, temperature, and salinity) and water sampling for subsequent chemical analyses.

Sediment sampling includes collect grab samples for chemical and toxicological analyses and benthic infauna community analysis.

Fish tissue sampling includes compositing fish tissue/species for chemical analyses.

◆ Wet weather water quality monitoring

◆ Dry weather water quality monitoring

● Task occurs at this time

● Sediment quality evaluations conducted in coordination with Bight Program years.

* Sediment quality objectives (SQO)

W Fall (October 1 – December 31)

Sp Spring (April 1 – June 30)

Su Summer (July 1 – September 30)

F Winter (January 1 – March 31)

COST ESTIMATE

To assist the RMC in understanding the relative magnitude of costs associated with an extensive monitoring program (as specified in the Harbor Toxics TMDL), Anchor QEA developed a cost estimate in spring 2013. The cost estimate was provided on an annual basis through 2018 and sub-totaled based on the required monitoring elements per year (i.e., sediment, water, and fish tissue monitoring and reporting). This cost estimate has been the basis for development of the cost share agreement that is incorporated into the Memorandum of Understanding amongst the RMC members.

Anchor QEA is committed to conducting the project as originally estimated. A summary of these costs, relative to our proposed project tasks described above is presented below.

Summary of Estimated Costs

Task	Estimated Cost
Task 1: Regional Monitoring Coalition Meeting Management	$160,658
Task 2: Compliance Monitoring Field Activities	$1,324,000
Task 3: Annual Reporting and Data Management	$602,000
Estimated Total Cost	**$2,086,658**

A summary of annual costs is summarized in the table below. This table shows a breakdown of costs for each monitoring element (water, sediment, and fish tissue). The specific scope of services and schedule for each element is presented in previous sections.

Water quality monitoring includes two wet weather and one dry weather monitoring event each year. For each monitoring event, three teams will be deployed to sample all 22 stations. Monitoring costs include mobilization, field collection, and chemical analysis.

Sediment sampling will be performed twice every 5 years and includes performing a SQO Part 1 sediment triad assessment at 22 stations. Sampling costs include mobilization, surface sediment grab sampling, chemical analysis, toxicity testing, and benthic community analyses.

Fish tissue sampling will be performed once every 2 years and includes trawling at four stations. Sampling costs include mobilization, fish trawls, and chemical analysis of composite samples for target species.

Task 3 costs include compliance monitoring reports and data validation and management. Reporting costs are estimated to be 20 percent of total costs, excluding project management. Data validation and management costs were determined based on the estimated number of samples submitted for each analysis.

Summary of Annual Costs

	2014	2015	2016	2017	2018
Task	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Task 1: Regional Monitoring Coalition Meeting Management					
Monthly Meeting Support and Coordination	$28,500	$30,210	$32,023	$33,944	$35,981
Subtotal	*$28,500*	*$30,210*	*$32,023*	*$33,944*	*$35,981*
Task 2: Compliance Monitoring Field Activities					
Water					
2 Wet Events (Sample Collection and In Situ Monitoring at 22 stations)	$43,000	$45,000	$48,000	$51,000	$53,000
1 Dry Event (Sample Collection and In Situ Monitoring at 22 stations)	$17,000	$18,000	$19,000	$20,000	$21,000

Task	2014 Year 1	2015 Year 2	2016 Year 3	2017 Year 4	2018 Year 5
Total Suspended Solids (22 stations x 3 depths + 4 QA/QC = 70 samples/event x 3 annual events = 210 samples/year)	$4,000	$4,000	$5,000	$5,000	$5,000
Total and Dissolved Metals, Organochlorine Pesticides, PCB Congeners (22 stations + 3 QA/QC = 25 samples/event x 3 annual events = 75 samples/year)	$77,000	$82,000	$86,000	$92,000	$95,000
Sediment					
SQO Part 1 Sediment Triad Assessment (Sample Collection and Processing at 22 stations)			$53,000		$56,000
Total Organic Carbon, Grain Size, Metals, PAHs, Organochlorine Pesticides, PCB Congeners (22 stations + 3 QA/QC = 25 samples)			$29,000		$31,000
Benthic Community Composition (22 stations + 3 QA/QC = 25 samples)			$23,000		$25,000
Acute Amphipod Survival (22 stations + 3 QA/QC = 25 samples)			$50,000		$54,000
Chronic Sub-Lethal Polychaete or mussel (22 stations + 3 QA/QC = 25 samples)			$50,000		$54,000
Tissue					
Trawling (Sample Collection and Processing at 4 stations)	$19,000		$21,000		$24,000
% Lipids, Organochlorine Pesticides, PCB Congeners ([3 stations x 3 species] + [1 station (CS) x 1 species]) x 3 composites + 3 QA/QC = 33 samples)	$13,000		$15,000		$17,000
Subtotal	*$173,000*	*$149,000*	*$399,000*	*$168,000*	*$435,000*
Task 3: Annual Reporting and Data Management					
Other Required Elements					
Laboratory Analytical Data QA/QC	$13,000	$12,000	$17,000	$13,000	$16,000
Data Analysis and Electronic Database/Deliverable	$12,000	$12,000	$17,000	$13,000	$16,000
Reporting	$40,000	$35,000	$87,000	$39,000	$87,000
Project Management	$24,000	$21,000	$52,000	$24,000	$52,000
Subtotal	*$89,000*	*$80,000*	*$173,000*	*$89,000*	*$171,000*
Total per year	**$290,500**	**$259,210**	**$604,023**	**$290,944**	**$641,981**

Assumptions

- Source control investigative work such as TIEs or additional monitoring "upstream" of TMDL-specified monitoring locations will not be conducted.
- The RWQCB does not require any additional monitoring events, monitoring stations, and/or analytical parameters other than those already specified in the Harbor Toxics TMDL. Additional monitoring, as directed by the RWQCB, would incur additional costs.
- Coordination with other monitoring programs (e.g., MS4 permit monitoring requirements) other than the SCCWRP's Regional Bight Monitoring Program does not occur. Although, some data collected as part of this program may be used by each RMC member to satisfy requirements of other programs; additional monitoring activities to satisfy all monitoring requirements of other programs would incur

additional costs. Each RMC member can determine how data generated through Harbor Toxics TMDL compliance monitoring program may be used for other purposes.

- Compliance monitoring will be required until the Greater Harbor Waters has been shown to be compliant with the Harbor Toxics TMDL. Pending decisions made during the reopener scheduled for 2018, the scope of these compliance monitoring activities and responsible parties may be amended. Costs for compliance monitoring activities occurring in 2019 and beyond are not included in this estimate.
- A 6 percent annual escalation rate was applied to the compliance monitoring cost estimate based on the following reasons:
  - Incorporates an industry-average inflation rate of 3.5 percent.
  - Incorporated to provide flexibility to address unforeseen support needs, including:
    - It is likely that unforeseen coordination activities may be required in communications with the RWQCB and RMC or coordination with regional monitoring programs.
    - The cost estimate was originally developed using 2013 rates for a variety of subcontractors and every attempt was made to use the most cost-effective alternative. Because the cost estimate was being developed with an understanding that a contract to conduct the work would not be authorized until 2014, Anchor QEA was not in a position to develop subcontracts or make scheduling commitments with subcontractors. Therefore, this escalation rate provides for increases in subcontractor rates that may be driven by contractor and equipment availability.
    - False starts in the stormwater sampling program are not included. We believe the 24-hour delay in sampling will prevent full mobilization for storms; however, internal preparation may still impact the budget. For example, laboratory coordination and staff time for equipment calibration and preparation.

Resumes

Andrew Martin

Shelly Anghera, Ph.D.

Wendy Hovel, Ph.D.

Chris Osuch

Joy Dunay

Laurel Menoche

Brittany Geisler

Dustin Fellers

Bonnie Ahr

Andrew Martin

Managing Environmental Scientist

Andrew Martin is a managing environmental scientist with more than 18 years of multi-disciplinary environmental science data collection, interpretation, and presentation expertise. He has designed, implemented, and managed a variety of programs in the marine environment and surrounding watersheds He is skilled in collecting sediment, water, and biological samples; performing dry weather and stormwater monitoring; and investigating contaminant sources via contaminant fate and transport studies and marine biological habitat surveys. In addition, Mr. Martin has a thorough understanding of project-specific and regional sediment management requirements and has developed dredge material management plans, long-term management strategies, and beneficial use alternative strategies. He has managed programs to support development of Total Maximum Daily Loads (TMDLs), Environmental Impact Statements, National Pollutant Discharge Elimination System (NPDES) permit requirements, special research studies, and ecological emergency response activities (i.e., Natural Resource Damage Assessments). Mr. Martin also has extensive expertise in hydrographic, oceanographic, geophysical, and dive surveying. He applies innovative technological methods to more accurately and extensively collect environmental data.

EDUCATION

University of Washington, B.S., Geological Oceanography, 1995

CERTIFICATIONS

40-hour HAZWOPER

CPR, AED, and First Aid

Project Experience

Harbor Toxics TMDL Support

Ports of Long Beach and Los Angeles
San Pedro Bay, California

The Port of Los Angeles and Port of Long Beach (Ports) are required to develop and implement a strategy that will allow the Ports to comply with the TMDL for Los Angeles/Long Beach Harbor. The strategy involves identifying contaminant sources and establishing links between sources and current sediment and tissue impairments, so that effective remedial actions can be taken. Specific projects that Mr. Martin has managed as part of this ongoing program include developing and implementing a Coordinated Compliance Monitoring and Reporting Program, facilitating a regional monitoring coalition consisting of 14 separate stakeholders, developing a sampling strategy to determine rates of natural recovery, and developing a sampling strategy to capture dry and wet weather (stormwater) runoff.

As part of the project, Mr. Martin participates and presents ongoing work at meetings with state and local regulatory agencies and other stakeholders on behalf of the Ports. He also provides program management support, including review of invoices, budget forecasting, and project scheduling.

Project Experience (Continued)

Fish Harbor Sediment Characterization
Port of Los Angeles
San Pedro Bay, California

The Port of Los Angeles is required to remediate contaminated sediments within Fish Harbor. Mr. Martin developed a sampling program and conducted field sample collection of surface and subsurface sediment samples to evaluate the horizontal and vertical extent of contaminant migration and to assess surface sediment chemistry relative to the Sediment Quality Objectives (SQO) Part 1 chemistry line of evidence. Results were used to develop feasible remediation alternatives.

Western Anchorage Dredged Material Evaluation
Port of Long Beach
San Pedro Bay, California

The Port of Long Beach required geotechnically suitable material for placement within the Phase I Middle Harbor Fill Site. Mr. Martin developed a sampling program and conducted field sample collection of subsurface sediment samples to evaluate the suitability of temporary stored sediments at the Western Anchorage Sediment Storage Site for use as fill.

Piers T and J Dredged Material Evaluation
Port of Long Beach
San Pedro Bay, California

Mr. Martin developed a Sampling and Analysis Plan (SAP) and coordinated field sampling for the Tier I characterization of proposed maintenance dredged material for its suitability for use as fill material at the Phase I Middle Harbor Fill Site. The project required collecting and assessing post-dredge surface (i.e., z layer) sediment samples.

Middle Harbor Fill Site Borrow Pit Tier I Evaluation
Port of Long Beach
San Pedro Bay, California

The Port of Long Beach required geotechnically suitable material for placement within the Phase I Middle Harbor Fill Site. Mr. Martin developed a Tier I suitability determination in accordance with UTM guidelines and based on relevant historical data to designate a borrow pit site, located within the footprint of the proposed Phase II Middle Harbor Fill Site.

Shelly Anghera, Ph.D.

Principal Scientist

Dr. Shelly Anghera is a principal scientist with more than 17 years of experience conducting field and laboratory studies related to marine eco-toxicology and sediment quality characterization. Dr. Anghera has focused on providing specialized environmental services for the Ports of Long Beach and Los Angeles for the past 10 years. Her expertise centers on field study design, sediment characterization, water and sediment testing and analysis, implementation strategies for total maximum daily load (TMDL) compliance, and Sediment Quality Objective (SQO) application. Dr. Anghera has taught courses on TMDLs, toxicity testing, SQO, and ecological risk in contaminated sediments. Her projects often focus on the integration of multiple lines of evidence to determine sediment quality for dredged material, beneficial reuse of contaminated sediments, and sediment TMDL implementation planning. Recent projects include Port-Wide Sediment Management Plans, TMDL support, water quality monitoring, and sediment and water quality characterization within the Los Angeles/Long Beach Harbor in support of the Water Resource Action Plan (WRAP).

EDUCATION

University of California, Los Angeles, Ph.D., Environmental Health Sciences, 2004

University of California, Santa Barbara, B.S., Aquatic Biology, 1995

CERTIFICATIONS

40-hour HAZWOPER

CPR, AED, and First Aid

Project Experience

Harbor Toxics TMDL Support

Ports of Long Beach and Los Angeles
San Pedro Bay, California

Dr. Anghera is the Dominguez Channel and Greater Los Angeles and Long Beach Toxic Pollutants Total Maximum Daily Loads (TMDL) program manager for the Ports of Long Beach and Los Angeles (Ports). Support services include developing innovative programs to optimize the management of contaminated sediments and designing TMDL long-term compliance strategies. Ongoing activities include inter-port strategic planning, regulatory agencies coordination, and implementation and monitoring program development.

Harbor Toxics TMDL Special Study

Ports of Long Beach and Los Angeles
San Pedro Bay, California

Dr. Anghera was the lead scientist for the characterized sediment contaminant flux for Inner Harbor and Outer Harbor waterbodies to support sediment TMDL development and implementation for the Ports. She designed a statistically powerful sampling program to characterize sediment, porewater, and overlying water to support the development of models to estimate contaminant flux from the sediment. She oversaw all elements of sampling and reporting and continues to interface with regulators on data use and implications of pending TMDLs.

Project Experience (Continued)

Water Resource Action Plan
Ports of Long Beach and Los Angeles
San Pedro Bay, California

Dr. Anghera developed the sediment management component of the WRAP for the Ports. Efforts included reviewing, summarizing, and presenting all available sediment data. Summarizing regulatory compliance standards was coupled with identifying priority management areas to bring the Ports into compliance. Project elements included developing sampling plans, water/sediment/soil sample collection throughout the Harbor Complex, analyzing data, reporting, presenting findings to stakeholders on behalf of the Ports, and representing the Ports at regulatory meetings.

Middle Harbor Redevelopment Sediment Management Plan
Port of Long Beach
San Pedro Bay, California

Dr. Anghera developed this project-specific Sediment Management Plan with Port of Long Beach staff to illustrate the its decision process for the management of sediments generated within and imported to the Port of Long Beach, define management priorities for contaminated and uncontaminated sediments, and define procedures for the maintenance of water quality during the movement (importing, mining, exporting, and disposal) of sediment. The Middle Harbor redevelopment project is a large strategic redevelopment project in the Port of Long Beach. Project elements include dredging, importing, and placing materials.

Port-Wide Sediment Management Plans
Port of Long Beach
San Pedro Bay, California

Dr. Anghera developed a Port-Wide Sediment Management Plan to illustrate the Port of Long Beach's decision process for the management of sediments generated within the Port of Long Beach. The document defines the management priorities for contaminated and uncontaminated sediments as well as procedures for maintaining water quality during the movement (importing, mining, exporting, and disposal) of sediment. Dr. Anghera also led development of the Contaminated Sediment Management Plan for the long-term management of legacy contaminants in sediments to ensure management actions are ecologically beneficial and logistically and economically feasible. The plan details a process to identify, prioritize, and manage chemically impacted sediments, where necessary, to protect and improve benthic community health. The plan uses a risk-based approach to assess benthic impacts due to chemically mediated effects as a means for determining the magnitude and extent of possible cleanup actions. These documents satisfy control measures identified in the WRAP.

California State Sediment Quality Objectives
Ports of Long Beach and Los Angeles
San Pedro Bay, California

Dr. Anghera developed a series of reports and comment documents to determine implications of pending State SQOs. She analyzed all available sediment and benthic infauna data under SQO methodology. Dr. Anghera continues to attend TAC meetings on behalf of the Ports and determine applicability of SQO tools into the TMDL long-term monitoring program.

Wendy Hovel, Ph.D.

Managing Environmental Scientist

Dr. Wendy Hovel expertise centers on sediment chemical characterization, specialized studies (e.g., sediment contaminant flux and toxicological investigations), beneficial reuse alternatives assessment, sediment toxicity identification evaluations, sediment management, Total Maximum Daily Loads (TMDLs), and bioaccumulation potential assessments. Dr. Hovel has managed or provided technical advice on projects for many large, multi-disciplinary sediment investigations, including those for a number of U.S. Army Corps of Engineers (USACE) districts and divisions (e.g., New Orleans, New York/New Jersey, New England, Los Angeles, and Wilmington), Ports (e.g., Los Angeles and Long Beach), and the U.S. Navy (e.g., Pacific Division [Naval Facilities Engineering Command]). As part of these projects, specialized programs were required to statistically assess sediment chemistry data gaps, delineate the spatial extent of sediment contamination, or design and implement specialized analytical tests.

EDUCATION

University of California at Davis, Ph.D., Pharmacology and Toxicology, 2005

College of William and Mary, M.S., Marine Science, 1999

St. Olaf College, B.A., Biology, 1995

Project Experience

Project Experience Subheading (if applicable)

Total TMDL Support

Ports of Long Beach and Los Angels
San Pedro Bay, California

Dr. Hovel has been providing quality assurance/quality control (QA/QC) oversight and managing projects that support the implementation of a strategy that will allow the Ports of Long Beach and Los Angeles (Ports) to comply with the TMDL for Los Angeles/Long Beach Harbor. The strategy involves identifying contaminant sources and establishing links between sources and current sediment and tissue impairments such that effective remedial actions can be taken. Specific projects that Dr. Hovel has managed as part of this ongoing program include a comprehensive data review, historical sediment compilation, fish tissue and mussel chemistry datasets, and Programmatic Quality Assurance Project Plan development. She is currently managing the data gap analysis to support development of a conceptual site model and numerical sediment transport, chemical fate, and bioaccumulation models under development.

As part of the project, Dr. Hovel participates and presents ongoing work at meetings with state regulatory agencies and other stakeholders on behalf of the Ports to gain approval for each project underway or proposed in support of the strategy to identify sources and establish linkages to sediment and fish impairments.

Project Experience (Continued)

Water Resources Action Plan Sediment Quality Control Measures

Ports of Long Beach and Los Angeles
San Pedro Bay, California

Dr. Hovel managed this literature review on the current sediment conditions in the Harbor Complex, based on all surface sediment characterization and monitoring studies conducted since 1987. She worked with the Ports to summarize sediment chemistry data from primary and gray literature, presented data in GIS maps and tables, categorized mapped data using TMDL listing criteria/numeric targets (cleanup criteria) and other applicable criteria, established sediment quality data gaps and performed additional sampling and analysis (Los Angeles Harbor only), and summarized data on both a project site-specific and harbor-wide basis (based on State 303(d) listings and potential TMDLs). She identified priority management areas to bring the Ports into compliance.

Additional Chemical Characterization of Sediments along Berths 240X, Y, and Z

Port of Los Angeles
San Pedro Bay, California

Dr. Hovel led a team of scientists to design a sediment sampling program to determine whether contamination from the landside portion of a leasehold area was leaching contaminants into the water and sediment on the waterside portion of the leasehold area. She worked effectively with federal and state agencies to design this program, manage the Sampling and Analysis Plan (SAP), and perform sample size justification, mapping, QA, and statistical analyses.

San Pedro Waterfront Program, Downtown and 7th Street Water Cuts Soil and Sediment Assessment

Port of Los Angeles
San Pedro Bay, California

Dr. Hovel managed this dredge material assessment for the Port of Los Angeles to determine whether material (mostly sandy fill) was suitable for ocean disposal or upland placement. She developed a phased testing approach and SAP for evaluation of soil and sediment in an upland area that was historically a wetland. She managed a soil and sediment field sampling effort, coordinated phased results with the Port of Los Angeles and state and federal regulatory agencies, and managed analytical testing, a QA program, and reporting efforts.

Bight 2008 Toxicology Committee and Testing Program

Southern California Coastal Water Research Project
Southern California

Dr. Hovel assisted in the development of the toxicity testing component of Southern California Bight 2008 Regional Monitoring Project (Bight 2008) program for the County of San Diego and Co-Permittees Regional Harbor Monitoring Program, a cooperative regional-scale monitoring begun in 1994 that includes participation by regulators and dischargers and was designed to address an appropriate set of regional-scale questions.

Chris Osuch

Senior Scientist

Chris Osuch is an senior scientist with more than 14 years of professional experience. His areas of technical expertise include dredge material evaluations and management, sediment chemical characterizations, water quality monitoring programs, aquatic toxicology, and Total Maximum Daily Loads (TMDLs). He has managed multiple dredge material evaluations to determine suitability for open-water disposal, beneficial reuse, or upland placement as well as water quality monitoring projects to assess impacts of discharge. Mr. Osuch is currently functioning as the field coordinator for Anchor QEA's California offices and has managed multiple sediment, water quality, and benthic macroinvertebrate sampling programs. He has experience with a wide variety of sampling techniques, including the use of a vibracore, piston core, box core, diver core, Van Veen, Ekman, petite ponar, Seabird CTD, and various water quality meters (e.g., YSI, Hydrolab, Orion).

EDUCATION

University of California, Santa Barbara, B.A., Environmental Studies, 1998

CERTIFICATIONS

40-hour HAZWOPER

CPR, AED, and First Aid

Project Experience

Harbor Toxics TMDL Support

Ports of Long Beach and Los Angeles
San Pedro Bay, California

Mr. Osuch reviewed and provided comments to the Regional Water Quality Control Board (RWQCB) on the developing Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters TMDL. This effort included assessing data quality and recommendations on usability. Mr. Osuch performed an assessment of current sediment conditions within the Harbor Complex using effects range low values and California Sediment Quality Objectives (SQOs) to compare fiscal impacts for demonstrating TMDL compliance. Benthic health was also assessed following SQO procedures to demonstrate the overall health of the benthic community and potential impacts should remediation occur. Mr. Osuch performed the data review, oversaw development of maps, performed SQO assessment and final categorization of preliminary Bight '08 data, and prepared the technical memorandum summarizing results. Mr. Osuch is currently performing a review of existing harbor data to identify additional data collection needs and to support the development of management tools for evaluating strategies for long-term TMDL compliance.

Project Experience (Continued)

West Basin (IR Site 7) Sediment Remediation

Port of Long Beach
San Pedro Bay, California

Mr. Osuch provided management and oversight of sediment sampling in support of a remediation project at the former Long Beach Naval Station and Shipyard. More than 500,000 cubic yards of contaminated sediments were dredged from AOECs A and C. Mr. Osuch led sediment grab sampling efforts throughout construction to verify removal of chemically impacted sediments and identify additional dredging needs. Following the completion of construction, Mr. Osuch managed the post-dredge confirmatory sampling program to determine if Sediment Management Objectives (SMOs) were met. Mr. Osuch developed the Health and Safety Plan (HASP), prepared the Sampling and Analysis Plan, led post-dredge sediment core sampling and analysis, prepared the Field Report, oversaw calculation of surface-weighted average concentrations to determine compliance, and assisted with the development of the Implementation Report.

Rhine Channel Contaminated Sediment Cleanup

City of Newport Beach
Newport Beach, California

Mr. Osuch provided management and oversight of water column monitoring to assess water quality effects related to dredging of contaminated sediments from Rhine Channel. Mr. Osuch prepared the Water Quality Monitoring Plan (consisting of a Sampling and Analysis Plan and Quality Assurance Project Plan), developed standard operating procedures outlining equipment and methods for each water quality sampling task, and prepared multiple reports summarizing the data. In addition, Mr. Osuch developed the post-dredge sediment characterization SAP and led post-dredge sediment core and grab sampling to verify successful removal of chemically impacted sediments. Mr. Osuch worked effectively with RWQCB and California Coastal Commission to ensure the successful completion of this project.

Joy Dunay

Environmental Scientist

Joy Dunay is an environmental scientist with more than 14 years of experience in the environmental industry, with an emphasis in analytical chemistry. She has extensive management experience with high-profile projects, including Superfund sites, which require a high level of data scrutiny, interpretation, and reporting. Ms. Dunay manages the chemistry group at Anchor QEA, which oversees laboratory and analytical method selection, quality assurance (QA) of analytical data (collection and analysis), and data validation using prescribed project documentation or U.S. Environmental Protection Agency (USEPA) functional guidelines. Ms. Dunay is a recognized leader in method development and implementation of specialized chemistry studies. In addition to project chemistry tasks, she leads the development of Programmatic Quality Assurance Project Plans (PQAPPs), Sampling and Analysis Plans, and Data Reports. Ms. Dunay also has extensive field experience using "clean hands" techniques for the collection of sediment, soils, groundwater, and air and often leads field audits with regulators.

EDUCATION

Binghamton University, B.A., Biology, 1998

Project Experience

Harbor Toxics TMDL

Ports of Long Beach and Los Angeles
San Pedro Bay, California

This project consists of several compliance monitoring and special studies tasks. Ms. Dunay is the QA manager and will coordinate with various contractors and internal staff to ensure that field and chemistry data quality meets the required standards (i.e., Surface Water Ambient Monitoring Program) as described in the PQAPP.

Port of San Francisco Maintenance Dredging Program

Port of San Francisco
San Francisco Bay, California

Ms. Dunay served as the QA manager for several maintenance dredging projects with the Port of San Francisco. She coordinated laboratory efforts, ensured sampling parameters were compliant with Green Book and Inland Testing Manual protocols, and ensured detection limits met various disposal option requirements. Additionally, she managed and verified data and wrote findings and results in the Sampling and Analysis Report.

Project Experience (Continued)

Newtown Creek Remediation Investigation and Feasibility Study

Day Pitney
New York City, New York

This Superfund project involves the phased collection of thousands of highly contaminated samples to investigate appropriate remediation activities. The testing program includes a full suite of chemical analysis including high-resolution forensic testing and emerging chemicals of concern. Ms. Dunay currently serves as the project chemist with responsibilities including client group presentations, QAPP writing, laboratory selection, and analytical method (and cleanup) selection. Additionally, she led the air monitoring program, which entailed developing a study design to evaluate whether the Newtown Creek was a potential source for specific chemicals within the surrounding area.

Percival Landing Environmental Investigations

City of Olympia
Olympia, Washington

This project involves a voluntary Remedial Investigation and Feasibility Study (RI/FS) at two former upland fuel storage tank sites. Ms. Dunay is the task manager and is writing the RI/FS as well as negotiating/selecting preferred cleanup alternatives with the Washington State Department of Ecology (Ecology) for the site(s). This project is in compliance with Model Toxics Control Act (MTCA) criteria.

Eddon Boatyard Site Remediation

City of Gig Harbor
Gig Harbor, Washington

This project involved a cleanup action including placement of an engineered cap. Ms. Dunay serves as the project manager and wrote the Project Completion Report and Long-Term Monitoring Plan. Effort involved coordination and communication with the client and Ecology. In addition, she performs the annual long-term monitoring sampling, which entails data evaluation against Sediment Management Standards (SMS).

Quendall Terminals Remedial Investigation and Feasibility Study

Renton, Washington

This Superfund project involved collecting hundreds of samples to investigate appropriate remediation activities. Newer performance methods were selected including solid phase microextraction alkylated polycyclic aromatic hydrocarbons and porewater volatile organic compounds. Ms. Dunay served as the QA manager with responsibilities that included QAPP writing, laboratory selection, analytical method selection, target analyte list section, and reporting limit selection. Ms. Dunay worked with the laboratories to ensure required performance evaluations were documented. She also wrote up the QA section of the Data Report, which involved evaluating data against data quality objectives. Additionally, she was part of the field crew for the sampling effort that involved collecting and processing sediment cores..

Laurel Menoche

Senior Data Analyst/Environmental Scientist

Laurel Menoche has 12 years of experience working with relational databases within Microsoft Access, Microsoft SQL Server, Visual FoxPro, and FoxPro, including designing, querying, importing, exporting, maintaining, and providing quality assurance/quality control (QA/QC). She is also proficient with Microsoft Excel, including running calculations and statistics and creating charts and tables.

EDUCATION

University of Rhode Island, B.S., Environmental Management, 1996

Project Experience

Newtown Creek Remedial Investigation and Feasibility Study *Day Pitney* *New York City, New York*	Ms. Menoche is the data lead. This Superfund project involves the phased collection of thousands of highly contaminated samples to investigate appropriate remediation activities. The testing program includes a full suite of chemical analysis including high resolution forensic testing and emerging chemicals of concern.
Integrated Remediation, Shoreline Restoration, and Berth Improvements at Gasco Site *NW Natural/Kopper* *Portland, Oregon*	Ms. Menoche is the data lead. Anchor QEA is leading a Remedial Investigation/ Feasibility Study and remedial design of the NW Natural Gasco site on the Willamette River in Portland, Oregon. The sediments, soils, and groundwater at the site, a former oil gasification facility, are impacted with polycyclic aromatic hydrocarbons (PAHs), cyanide, and some metals.
Port Gamble Water System *Olympic Property Group, LLC* *Kitsap County, Washington*	Ms. Menoche is the data lead. Anchor QEA provided ongoing water system planning and design tasks for the town of Port Gamble in Kitsap County, Washington. Water system planning was completed in accordance with State Department of Health Standards as part of an ongoing planning effort to enable redevelopment of the town. Work included evaluation and sizing of water system upgrades, evaluation of well sources and storage facilities, and development of an improvement plan. Anchor QEA staff also worked with the water system owner to submit a successful application for a Drinking Water State Revolving Fund Loan. Ongoing work has included evaluation of water system capacity and improvements for different development scenarios.

Brittany Geisler

Environmental Scientist

Brittany Geisler is an environmental scientist with more than 6 years of professional experience. Her areas of technical expertise include water quality monitoring programs and sediment chemical characterizations. She has participated in multiple water quality monitoring projects to assess impacts of discharge as well as dredge material evaluations to determine suitability for open-water disposal, beneficial reuse, or upland placement. She has experience with a wide variety of sampling techniques, including the use of a vibracore, piston core, box core, Van Veen, and various water quality meters (e.g., Hydrolab, Horiba) and water collection equipment (e.g., Van Dorn).

EDUCATION

University of California Irvine, B.A., Social Ecology, 2006

CERTIFICATIONS

40-hour HAZWOPER

CPR, AED, and First Aid

California Department of Boating and Waterways Safe Boater Certification

Project Experience

Harbor Toxics TMDL Support

Ports of Long Beach and Los Angeles
San Pedro Bay, California

Ms. Geisler is currently supporting the Ports of Long Beach and Los Angeles with coordination, moderation, or documentation of several ongoing groups, including the Harbor Toxics Working Group and the Greater Harbor Waters Regional Monitoring Coalition.

Alamitos Bay Marina Rehabilitation

City of Long Beach
Long Beach, California

Ms. Geisler assisted with sediment investigation for Basins 2, 3, 5, and 7 and water quality monitoring during dredging for Basin 5.

Regional General Permit 54 Reauthorization

City of Newport Beach
Newport Beach, California

Ms. Geisler assisted with the sediment characterization for more than 50 stations throughout Newport Harbor in preparation for reauthorization of Regional General Permit 54.

Supplemental Remedial Investigation

Duwamish Shipyard, Inc.
Seattle, Washington

Ms. Geisler assisted with stormwater and catch basin solids sampling, surface sediment collection, and subsurface sediment characterization to address data gaps as required by the Washington State Department of Ecology.

Dustin Fellers

Environmental Scientist

Dustin Fellers is an environmental scientist with nearly 6 years of professional experience. His areas of technical expertise include water quality monitoring programs and sediment chemical characterizations. He has participated in multiple water quality monitoring projects to assess impacts of discharge as well as dredge material evaluations to determine suitability for open-water disposal, beneficial reuse, or upland placement. He has experience with a wide variety of sampling techniques, including the use of a vibracore, piston core, box core, Van Veen, and various water quality meters (e.g., Hydrolab, Horiba) and water collection equipment (e.g., Van Dorn).

EDUCATION

Bethel University, B.A., Spanish, 2006

CERTIFICATIONS

40-hour HAZWOPER

CPR, AED, and First Aid

California Department of Boating and Waterways Safe Boater Certification

Project Experience

Lower Newport Bay Federal Dredging Program

City of Newport Beach
Newport Beach, California

Mr. Fellers assisted with water column monitoring to assess water quality effects related to dredging of sediments from Lower Newport Bay. Monitoring consisted of field measurements (i.e., temperature, dissolved oxygen, pH, turbidity, transmissivity, salinity) and water sampling for laboratory analysis before and during dredging activities.

Alamitos Bay Marina Rehabilitation

City of Long Beach
Long Beach, California

Mr. Fellers assists with sediment investigations and water quality monitoring before, during, and after dredging for each of the basins. Mr. Fellers prepares weekly and monthly reports summarizing data.

Regional General Permit 54 Reauthorization

City of Newport Beach
Newport Beach, California

Mr. Fellers assisted with sediment characterization for more than 50 stations throughout Newport Harbor in preparation for reauthorization of Regional General Permit 54.

Rhine Channel Contaminated Sediment Cleanup

City of Newport Beach
Newport Beach, California

Mr. Fellers assisted with monitoring activities for the Rhine Channel contaminated sediment cleanup project. Mr. Fellers performed water column monitoring to assess water quality effects related to dredging.

Bonnie Ahr

Environmental Scientist Intern

Bonnie Ahr is an environmental scientist intern who is currently finishing her thesis work on habitat utilization and movement behavior of white croaker in the Los Angeles/Long Beach Harbor. Ms. Ahr specializes in fish biology, behavior, and movement. She has assisted on a wide range of remediation, water quality monitoring, and sediment projects both in the field and in background research. Ms. Ahr has participated in an array of field work involving fish collection and surveying including beach seining, transect and quadrat surveys, aerial surveys, and fish tracking using acoustic telemetry.

EDUCATION

California State University Long Beach, M.S., Biology, In Progress

Arizona State University, BS., Life Sciences, 2010

Project Experience

Fish Tracking Special Study Phase 1

San Pedro Bay

Ms. Ahr is part of the white croaker fish tracking team from California State University Long Beach using acoustic telemetry to quantify fish movement and behavior within the harbor. She caught and surgically implanted acoustic transmitters in 100-plus white croakers in the harbor and monitored fish movement using both a shipborne receiver and passive stationary receivers. Ms. Ahr constructed, deployed, maintained, and collected data from passive receivers and temperature data loggers for the year the receivers were in the field. Ms. Ahr also has extensive small boat handling experience that includes actively tracking tagged fish for continuous 24-hour periods. Ms. Ahr has been leading the data analysis of the fish tracking data, which focuses on modeling fish habitat selection and utilization. Ms. Ahr has also been heavily involved with the Phase II fish tracking study currently in progress and has assisted in the field with the collection of white croaker and halibut as well as maintenance and collection of data from passive receivers currently deployed.

Harbor Toxics TMDL Support

San Pedro Bay

Ms. Ahr assisted with literature reviews of the biobaseline studies conducted in 1988, 2000, and 2008 for vegetation and riprap coverage. Ms. Ahr has also assisted in GIS support for the Total Maximum Daily Load (TMDL) program including digitizing riprap coverage in the harbor, benthic infauna interpolations, and fish movement analysis. Ms. Ahr has provided fish movement and habitat analysis for use in the bioaccumulation model currently under development. She also assisted with the writing of the data gap analysis report—specifically regarding fish growth rates, respiration rates, diet, and movement.

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